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High Temperature Procured from Carbon.

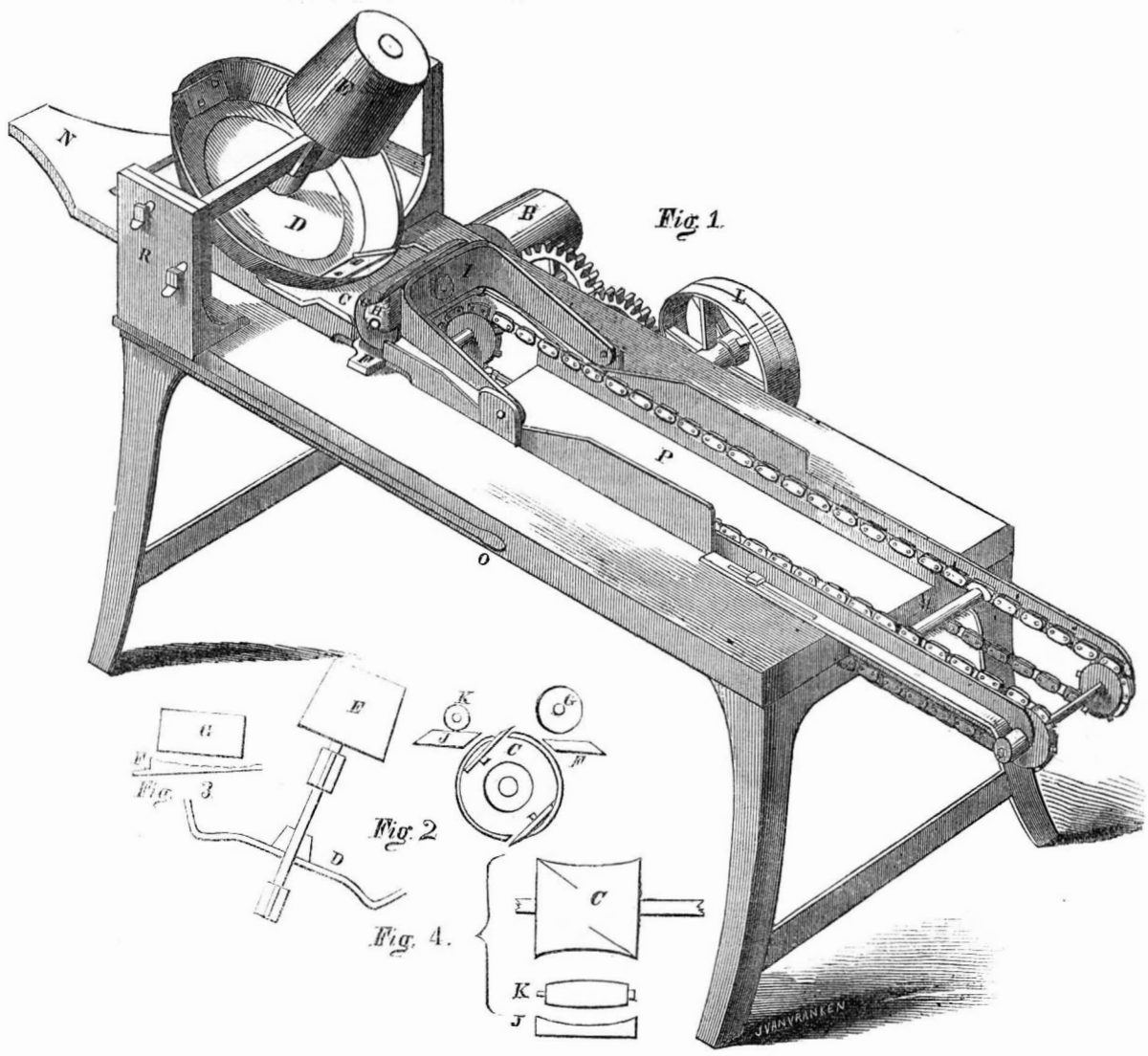
The following communication has been made to the French Academy by M. Deville. "It is well known that near the tuyeres of blast furnaces, a very elevated temperature is developed, which M. Eblemen considers to be equal to the melting point of platinum. Some experiments made in the course of an investigation, although different, have led me to believe that the heat developed during the combustion of carbon, is capable of producing effects much more energetic and comparable with those obtained by means of a mixture of hydrogen and oxygen. Thus, by a suitable arrangement of the furnace, and with the proper kind of carbon, it is possible to melt and even to volatalize platinum and to melt pure silica. These results, and the simplicity of the means by which they may be obtained, have convinced me that they will become useful to the chemist and manufacturer. I have therefore decided upon submitting to the Academy the details of the operation, which, I trust, will not be found unworthy of attention. The apparatus which I employ is a simple furnace, 30 centimetres high, and 18 centrimetres diamet r, supported on a plate of cast iron pierced with holes, arranged in a circle 5 centimetres from the centre. This is placed in connection with the bellows of a portable forge. The best kind of crucibles melt down at the temperature in question, to a perfectly liquid glass, and for a substitute I was obliged to have recourse to pieces of well burnt lime, which may easily be brought into the shape of thick crucibles. Their covers are likewise made of lime. M. Berthier observed that hydraulic limes were readily fused at a high temperature, and I have found they very frequently agglutinated. It is, therefore, indispensable to employ a somewhat porous lime.—With regard to the combustible, it must be very porous and in a state of very fine division; and I should add, that I succeeded only when I made use of the residue of the imperfect combustion of coal, the clinkers mixed with cinders which fall from the grate of the heating apparatus and still at the Ecole Normale, passed through a wire sieve. With coal of the best quality, in very small particles, the effects are much more feeble, and do not differ from those which have already been obtained."—[Comptes Rendus.

Painter's Colors.

At the last meeting of the Society of Encouragement of National Industry, in Paris, President Dumas proposed that the section on fine arts should undertake to ascertain the colors which are used by the most distinguished painters. He is of the opinion that the colors employed in painting have a great influence on the value of pictures, especially as to their preservation of the flesh tints and local colors. A member of the society, a painter, has already shown that Rubens never used more than nine kinds, and in some instances only seven, with which he composed all the other colors.

Inunction, or anointing, is said to be a successful mode of treating scarlatina, relaxing, as it does the skin, adminishing the heat, and in some cases causing perspiration.

ELLIOT'S RIVED STAVE DRESSING MACHINE.



The annexed figures illustrate a machine for dressing rived staves, invented by J. D. Elliot, of Leicester, Mass.

Figure 1 is a perspective view; fig. 2 is a sectional view, showing the relative positions of the principal cutting parts, and feed rolls. Fig. 3 is a sectional view of the inclined bed with catch teeth on the face, and with the swiveled roller, G. Fig. 4 is an end section view of the concave bed, J, and the roller, K, over it. The same letters refer to similar parts.

A is the table; B is a pulley, to drive the lower concave cutter head, C. D is the top or diagonal cutter head. E is the pulley which drives it. F is an inclined bed. G is an adjustable roller, resting upon the bed, F, and hung in a swiveled frame, H and I, and is held down by springs or weights. L are pulleys on a shaft for driving the endless feed chain. M is one of the bars connecting the feed chains; N is a plate for the stave to run out upon. O is a lever to guide staves that have a short crook near the end. The transverse position of the knives is shown in fig. 2, C being a side view of the concave cylinder. The roller, K, rests upon the concave bed, and is held down by springs or by weights.

OPERATION—When the machine is in motion, place an undressed stave between the chains and upon the post of the table, marked P, and place the end of the stave against the bar, M, which will pass the stave along endwise over the inclined bed, F, and under the swiveled roller, G, as shown in figs. 1 and 2. The knives in the concave cutter head, C, will round the lower side of the stave, and the knives in the diagonal cutter head, D, will hollow the top side of the stave, and pass it over the concave bed, J, and under the roll, K. Another undressed stave is then placed upon the bed, P, and the succeeding bar, M, will carry it along. The feed chain carries the first bar, M, down in front of the bed, F, and the ends of the staves coming together, the second will shove the first one through the machine. If the stave is crooked, take hold of the end of the stave and bar with one hand and lift it up, so that the other end of the stave will lie flat on the top of the bed, F; when the stave has passed under the roll, K, fig. 2, it is let go; the bar, M, will not then slip off, and the adjustable rolls, G and K, will keep the stave in its place, whether crooked or winding, and keep the position of the stave between the beds, F and J, in a straight line, so that it is dressed by the cutters, C and D, with the grain of the wood. If the stave is thick it is placed on the further side of the bed, P, which will pass it over the lower side of the inclined bed, F, fig. 3. The knives in the cutter head, C, fig. 2, will take off a portion of the extra wood; or if one edge of the stave is thin, the thin edge of the stave is passed over the high side of the bed, F, which is on a line with the cutting edge of the knives in C, and the edge of the bed, J, consequently the thin edge of the stave will pass along without being reduced by the knives of C or D. If the stave is of medium thickness pass it over the middle of the bed, F, and the knives in C will take off enough to smooth its outside; the remaining extra thickness will be removed by the knives in D; or if the stave is thick at one end and thin at the other, run it in askew, passing the thin end over the high side of the bed, E, and the thick end over the lower side of the bed, the swiveled roller, G, always adapting itself to the staves.

The cutting edge of the knives are straight in the cylinder, C, fig. 4, but are placed in transversely, so that they will dress a stave as rounding as the cylinder is concavo and perfectly smooth. The knives are adjustable in cylinder C, to the diameter of half barrels, barrels, and hogsheads; the diagonal cutter, D, is made adjustable to any diameter by the slots in the stand, R, which allow the placing of the shaft more or less toward the perpendicular.

Some of the advantages of this machine over all others, are its being adjustable to all sized casks, and thicknesses of staves, without adding to or taking from it a single piece, except the bed, J, which must be as hollowing as the stave is rounding. The knives in the cutter head, C, are adjustable.

The combination of the concave cutter head, C, with straight-edged knives, and the diagonal cutter head, D, will allow the beds, F and J, and the self-adjustable rollers, G and K, to come so near each other that a crooked or winding stave will be parallel with the beds at the cut of the knives, dressing both sides of the stave at the same time, and with the grain of the wood. The combination of the inclined bed, F, and swiveled roller, G. Fig. 3 enables the machine to save all the thin edges, by running them through, more or less, up the inclined bed, and all the thin ends by running them askew over the bed, F, and will dress a crooked and winding or thin-hearted stave as economically and as smooth as it can be dressed by hand. This dresser is simple, compact, and entirely made of iron.

The inventor represents the machine to be capable of dressing 300 to 400 staves per hour with the labor of one man. For further information apply to J. D. Elliot, Leicester, Mass.

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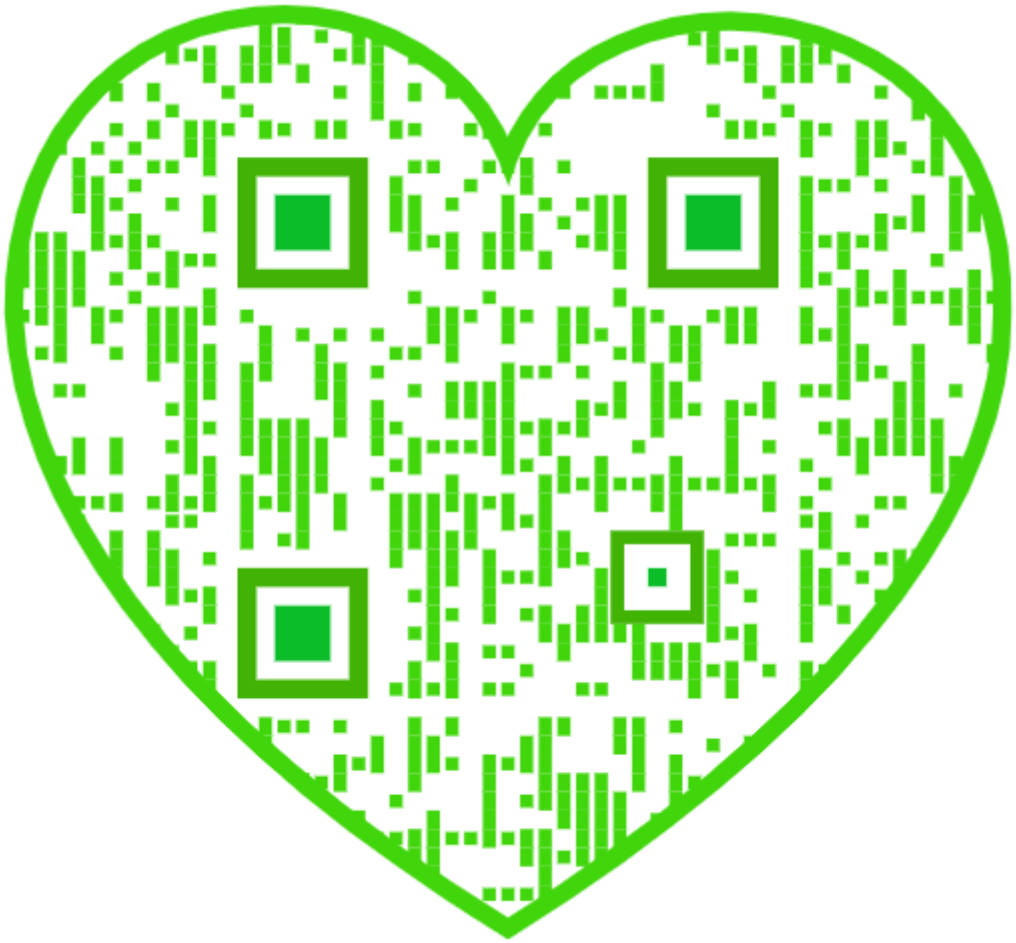

Researches on Ethers.

I. Formation of the Compound Ethers by Means of Ether and Acids.—Can ether, formed at the expense of alcohol by elimination of water, reproduce the alcohol whence it has arisen, or at least the combinations of which this alcohol forms an integral part? This question has been proposed more than once; and in spite of certain facts repeatedly announced, it is not, I think, regarded as settled, nevertheless it is not perhaps without some importance. In fact, in a theory widely received, the compound ethers are represented by an anhydrous acid combined with oxyd of ethyle, a substance isomerous or identical with ether. The direct production of the compound ethers by means of ether and the acids, has a tendency to support this view, although it is also susceptible of other explanations.

This production is effected by heating the acid and ether, enclosed in very strong tubes, to about 680° to 752° F.

The author has procured benzoic ether in this manner from ether and benzoic acid. It possessed the odor and specific properties of of benzoic ether, boiled at 416° F., and gave on analysis—

	Formula.		
Carbon . . .	72-2	. . .	72-2
Hydrogen . .	6-7	. . .	6-7

Treated with potash and water, it produces the benzoic acid; and in place of the ether, a volatile inflammable liquid, soluble in water, which, when touched with a drop of a mixture of sulphuric and butyric acids, evolves the odor of butyric ether. These characters belong to alcohol.

The ether employed in the preceding experiment had been shaken five times with its volume of water, so as gradually to dissolve the half; it was then dried upon chloride of calcium, and rectified. After nine hours' contact with the benzoic acid at 680° F., it furnished 30 per cent. of benzoic ether (16 grms. produced 5 grms.). The formation of the benzoic ether commenced at 572° F.; but at this temperature, even after long contact, there was but little of it.

With the view of acquiring greater certainty with regard to the purity of the ether employed, the author rectified the ether purified by the above method, distilling only the half of it at a fixed temperature; the distillation was then repeated upon this portion, only collecting the half of the product. The ether thus obtained furnished 25 per cent. of benzoic ether after three hours' contact with the acid at 680°.

Ether and butyric acid, kept for six hours at 680 F., produced butyric ether. The liquid in the tubes, submitted to distillation, only furnished ether, water, butyric ether and butyric acid. No gas was evolved.

At the same temperature, ether and palmitic acid produced palmitic ether, fusible at 72°.

In these instances neither the acid nor the ether was entirely combined, whatever might be the excess of one or other of them.

Ether and water, heated to the limit of decomposition (842° F.?), do not combine.

II. Direct Fomation of the Ethers of Alcohol and Acids.—The union of acid and alcohol to form ether is effected either directly or by the intervention of a mineral acid. The direct combination is generally easy with the energetic acids; but with the organic acids, such as acetic acid, becomes very slow and incomplete. But with the aid of sulphuric acid, the combination is immediately and almost completely effected.

The author has arrived at the following results by employing close vessels, and the assistance of long exposure to heat, in the direct preparation of the ethers:—

At 392° to 482° F., the combination of the alcohols with the fatty acids is effected with rapidity. In this manner the author produced at 482° F. the following ethers:—

Methylopalmitic ether, a crystalline substance, fusible at 82° F., solidifying at 72° F.;

Ethylopalmitic ether, fusible at 70°·7 F., solidifying at 64°·4 F., and reproducing by the action of potash, palmitic acid, fusible at 142° F.; and.

Amylopalmitic ether, a waxy substance, fusible at 48° F.; with potash it reproduces palmitic acid, fusible at 142° F.

The combination of the alcohols with the fatty acids is never complete, either for the alcohol or the acid. But these three ethers are most abundantly formed in the presence of an excess of acid, which is afterwards separated by lime and ether. When heated afresh to 500°. for fourteen hours, with eight or ten times their weight of palmitic acid, they are found, after the operation, to have undergone no change whatever.

With thirty hours, contact at 212° F., benzoic, acetic, and butyric ethers were produced in great abundance, especially the latter.—Stearic ether even begins to be formed in 102 hours, but in very small quantity. The addition of acetic acid to the mixture, in the latter case, causes the stearic acid to become completely etherified in 102 hours. This corresponds with the known action of sulphuric and muriatic acids, only differing in the comparative weakness of the acetic acid. It appears especially in this case, that the combination of the stearic acid with the alcohol is induced by that which takes place between the acetic acid and the same alcohol. It is a pretty clear instance of the propagation of molecular movement.

The ready etherification of the fatty acids in an alcoholic liquid, rendered acid even by acetic acid, appears to the author often to render the purification of these bodies very delicate.

III. On the Decomposition of the Ethers.—The ethers are split by the same agents which cause their formation. Thus—

Water heated to 212° F., for 102 hours, with stearic and oleic ethers, begins to split them, with regeneration of stearic and oleic acids.—Under these conditions it does not act at all upon benzoic ethers.

Acetic acid, diluted with 2 or 3 vols. of water, when in contact with stearic ether for 1060 hours at 212°, distinctly acidifies the stearic ether without producing acetic ether; it partially decomposes butyric and benzoic ethers, with formation of butyric and benzoic acids.

Fuming muriatic acid, in 106 hours, at 212°, produces double decomposition with acetic, butyric, benzoic and stearic ethers. The acids are set free, and muriatic ether is formed. The decomposition is never complete, unless in the case of stearic ether.

Thus a weak acid may be etherified or its ether decomposed at will under the influence of muriatic, or even of acetic acid. This difference in the action of the same substance results from the presence of excess of water in the one case, of alcohol in the other. The mass and relative energy of the acids are also to be taken into account.—M. Berthelet, "Comptes Rendus."

[For the Scientific American.]

Wind Mills in the South.

It having been necessary for some time for me to use wind mills for different purposes, I have been struck with the fact that while every other motive power has received great attention from our most skillful machinists, to simplify and make them useful to man, the application of wind as a motor (except to sail vessels) remains in the same bungling condition now as it was centuries ago in the fens of Holland. It is yet more singular that, in this country, with such an extended sea-coast, and such widespread prairies, where the wind blows with force three-fourths of the year, that the subject should not receive more attention. I do not wish to advance the idea, by any means, that wind can in any way compete with water or steam power where uniform and steady results are to be obtained, yet there are hundreds of minor but useful purposes that wind power could be put to by the planter, farmer, and mechanic, especially on our prairies and seaboard, to great advantage; provided our mechanics will hit upon some cheap, simple, and efficient method of constructing the windmill, and communicating its power.

I take it for granted that the common vertical wind mill, with inclined sails, is much more powerful than any horizontal mill yet invented, with like spread of sails. In fact, horizontal wind mills are powerless things unless of very large diameter, from the fact that in one of small diameter the wind acts at and near a tangent, a shorter space of time than in case of one of large diameter.

But the difficulty with a vertical wind mill is to gear off with simplicity and effect, from the necessity of always keeping the sails to the wind. This is perhaps the greatest difficulty for constructors and machinists to overcome; another thing they should do is to construct the different parts ready to put on, and in the tower, something after the manner of the different kinds of horse-powers now in use, so that they can be taken apart, and snugly packed for transport to any part of the country.

They should be built of different sizes and for different purposes, such as turning the smaller kinds of grinding mills, sawing wood or lumber with either a circular or reciprocating saw, pumping water, &c. That wind mills are now applied to many of those purposes is certain, for I have seen in Texas a little vertical mill not more than six or seven feet in diameter, busily at work grinding hominy, in a common hand steel mill. And I have seen a larger one of about twenty feet in diameter, with six sails, doing a very fair business in sawing lumber, the power being conveyed to the saw by a crank in the center of the wind sail shaft. I have no doubt but that an enterprising man who would make the improvements I have suggested, and show to the world that his wind mills were efficient and durable, could sell thousands of them in Texas and on the western prairies, not to mention the seaboard, especially if he so built them that the purchaser had little else to do than to put up the tower, to set them into operation. They should be relatively as cheap as the different kinds of horse powers that are now made so compact and useful.

As I have given some thought to the method of simplifying the construction of the smaller kinds of wind mills above suggested, perhaps some constructor in that line may gather useful ideas by reading what I have to say, but I fear it will not be easily understood.

I think that, for the purposes named, wind sails from fifteen to twenty-five feet in diameter would be amply large, especially if six instead of four sails are put on them, and in order to get strength, compactness, and lightness, the different parts should be made of iron.

The shaft of the wind-wheel proper should be made of wought iron, with collars or flanches at each end of the bearings or journals for reasons that will be obvious hereafter, and the bearings for the journals of the above shaft should be made in iron chucks connected with an iron circle, say of from five to eight feet in diameter, which is made to revolve on a fixed iron railway circle, which railway should have projecting flanches on each side to grasp corresponding flanches on the chucks of the revolving circle, to keep said circle from lifting. There should be four of these chucks to the revolving circle, and in the case of a wind mill for pumping, &c., which requires a crank on the shaft in the center between the bearings, the bearing of the wind-wheel shaft should be made on two opposite chucks of the revolving circle. But in case of one required to communicate a revolving motion, by banding off from a perpendicular shaft, the outer bearing of the wind wheel shaft should be on one of the chucks and the other in the center of the circle—where it can be made by connecting the opposite chucks of the revolving circle by an iron bar at right angles to the wind-wheel shaft, to which bar the bearing of the inner end of the wind-wheel shaft can be attached near the center of the revolving circle, and by the same arrangement, a bearing can be formed in the precise center of the said circle, for the journal of the upright shaft, to the upper end of which, and to the inner end of the wind wheel shaft, there can be fitted either bevel or miter wheels, as the case may require. The chucks to the revolving circle I have named should have rollers in them. These can be arranged by an obvious method, so that the revolving circle shall move easily over the fixed railway circle; there should likewise be stops to the chucks, so that the wind wheel can be fixed firm to its place when brought to the wind. To a mechanic the further arrangement of these parts will be obvious without further waste of words. Flanches should be fitted to the outer end of the wind wheelshaft, to fasten on the wind sail frame with bands and screws, which frame should be made of sheet iron, bent and molded to the right form for strength with wire. This frame can either be covered with canvas or boards.

As far as my experience goes the wind sails should incline with the plane of motion about 18° or 20°, or in other words should incline with the axis of motion 70° and 110° respectively.

It has been my intention in the above only to furnish hints, and it is for the mechanic and constructor to arrange and complete the details, but I will further add, that if the parts of wind mills above named, and likewise such as are there shadowed forth—strong, simple, compact, and cheap—could be got up by an enterprising man, who would persevere in introducing them, hundreds, yes thousands of them could be sold on our western prairies and in Texas, to say nothing of the sea-board. W. C. D.

Key West, Fla.

(For the Scientific American.)

Light and the Eyes.

As several articles have been published in the Scientific American, in relation to the care of the eyes, I have a word to say on the subject, which may be useful. My eyes are weak, and though they see far and distinctly when not fatigued, they become dim, blood-shot, and painful whenever made to undergo exertion during candle light, even for half an hour. For years this infirmity prevented me from reading and writing after sun-down, until I happened one night, while traveling on a steamboat, to have in my hand a book which greatly interested me, and which I continued to read by the light of a chandelier which hung from the roof of the cabin, and which threw its light upon a table, beside which I was sitting. I expected that, as usual, I would soon be obliged to close the book; but to my surprise no dimness or pain occurred to my eyes, and I continued to read without the least pain or inconvenience till past one in the morning. The next day my eyes were as well as usual. I attributed this to the fact that the light was above my head, and fell upon the paper in the same manner as the light of day—from on high. Was I right in this? I leave you to answer. Certain it is, I have had a large lamp, with three branches, hung up in my office, several feet over my desk, and find that I can now read and write for hours by its light, without difficulty or suffering.

Yankee Creole.

The Darien Ship Canal Expeditions.

Reports from both the Atlantic and Pacific expeditions across the Isthmus of Darien, to explore the country for a ship canal, have been received. The result of these observations is, that the proposed route is a continuous chain of mountains, with summits of four thousand feet. One portion of the Atlantic party is still on the way to the Pacific. The construction of the canal, according to these reports, is utterly impracticable; but whether the explorations were as thorough as they might have been, does not yet appear. Mr. Kennish, one of the canal engineers on the Pacific side of the expedition, says:

"I refrain from expressing my opinion as to the practicability of this route for a canal, because I do not consider our data sufficient to allow me to arrive at any conlcusion worthy of public confidence, even though I believe that the expedition I had the honor to accompany explored further and with more detail than any other individual or party before the present time."

The expedition was composed of a detachment of engineers sent out by the governments, of the United States, France, and England.—The construction of a ship canal, through the Isthmus, seems to be impracticable; the expedition has been successful in settling this point—a very important one.

The next meeting of the American Association for the Advancement of Science, will be held in Washington City, commencing on the 30th of April.

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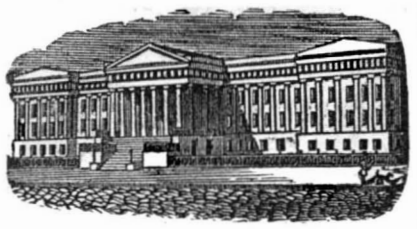

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING MARCH 7, 1854.

ARRANGEMENT OF FUSIBLE PLUGS, OR DISKS, FOR STEAM BOILERS—William Burnett, of Boston, Mass: I do not claim to have invented the application of fusible plates of steam boilers for the purpose of permitting the steam to escape, when it has reached any assigned limit; nor do I claim the method described of preventing the plate, which is remote from the boiler, from being fused by the heat of the boiler.

I claim the application to steam boilers of two plates or plugs of fusible alloy, arranged as described, one of said plates being remote from the boiler, and the other in the interior thereof, by which arrangement the pressure of the steam is admitted on both sides of the interior plate, as specified.

MACHINES FOR PLASTERING—Isaac Hussey, of Harveysburgh, Ohio: I claim the arrangement of the several parts of the machine as and for the purpose described.

[See engraving of this machine on page 164, Vol. 8.]

VALVE MOTION FOR LOCOMOTIVE ENGINES—Caleb Cook, of Nashville, N. H.: I do not claim, for operating the valves, an arrangement wherein a link is employed, and has attached to it the valve rod and the eccentric rod, the central pin of the link working in the eye of a horizontal arm attached to a rocker shaft; nor do I claim a modification of such, wherein would be the same link with the eccentric rod and valve rod attached, and having the center pin of the link moving in vertical or curved guides attached to the rocker shaft, as such modifications do not admit of the reversing the engine without the removing both the link and the eccentric rod; whereas, with my improvement such can be effected by moving the eccentric rod only.

I therefore limit my claim to my particular arrangement or construction of the open lever, as provided with two recesses, and connected to a rocker shaft, and applied to and made to operate with respect to the eccentric and valve rods, as described.

THE GAUGE OF STRAW CUTTERS—Warren Gale, of Louisville, Ky.: I claim the arrangement of the adjustable gauge, as described.

[An engraving of this machine is published on page 136, of this volume.]

OPENING AND CLOSING GATES—W. G. Philips, of Newport, Del.: I claim the double span rotating gate, opening and closing continually forward, by means of levers and inclined planes, as well as by pulleys and cords, combined and arranged as set forth.

ROUNDING AND BEVELING THE HEADS OF BARRELS—J. P. Heacock, of Marlboro', Ohio: I claim rounding and beveling a barrel head at one operation, in a very true and perfect manner, by the employment of a double edged adjustable cutter secured in a swinging frame, or forked lever, and moved from a vertical to a horizontal position, and vice versa, back and forth from one end of the stuff to the other, in combination with the clamping jaws for holding the stuff in a proper position while being operated upon, as set forth.

[See notice of this invention on page 60, Vol. 9.]

COTTON SEED PLANTERS—G. W. Cooper, of Palmyra, Ga.: I claim the combination of the saws and feeders, the said saws having a reciprocating rectilinear motion, and the said feeders having a reciprocating rotary motion, the above parts being constructed and arranged as set forth.

[See notice of this invention on page 380, Vol. 8.]

SASH FASTENERS—H. B. Kimble, of Rochester, N. Y.: I claim the combination of the peculiar form of the bolt having a locking notch, with a weighted lever, formed and operating as described.

SEWING MACHINES—Wm. H. Johnson, of Granville, Mass.: I claim, first, the making of a seam with a single thread, by the combination of a single needle, forked hook, and expanding lever, as specified.

Second, the forming or making of a seam from a single thread, by the running of a loop of the thread through the material to be sewed: the running of a second loop through the material, and putting the first loop through the second; the running of a third loop through the material and through the first-named loop; the carrying of a fourth loop through the material, and putting the third through it, and so on; putting the first loop through the second and around the third, the third loop through the fourth and around the fifth, and so on,—forming the belaying double loop stitch, as set forth.

Third, the feeding of the material to be sewn by means of a vibrating needle, by which the material is moved along as required for the stitch, as specified.

SASH SUSTAINERS—G. C. Hinman, of New Haven, Ct.: I claim the described sash sustainer, consisting of an arched rod attached to the horizontal part of the window, in such a manner that the weight of the sash shall cause the clogged ends of the rod to bear equally on both sides.

Also, as described, the lever thumb piece for increasing the arch of the rod, and relieving the pressure, so as to allow the window to be lowered, as described.

REELING MACHINES—George Sevan, of West Earl Township, Pa.: I claim the double disc, as constructed, with hinged wings, for the purpose of keeping the threads regularly stretched, and operating the sliding rail when one of the threads is broken, in the manner described.

SECTIONAL DRY DOCKS.—Samuel Loveland, of Astoria, N. Y.: I claim the transversely placed tank, trunk, or water chamber, of each section of the dock, forming not only a central water ballast in the float, directly under the keel of the vessel to be raised; but when empty, a dry tank for the purpose of giving access to the keel in repairs.

I also claim the tank, trunk, or chamber, in combination with the buoyant chambers, or floats, hollow guards or chambers, or when combined with chambers or floats attached to the ends of the trunk or float, in the manner set forth.

TAIL STOCKS FOR TURNING LATHES.—L. B. Tyng, of Lowell, Mass.: I claim constructing and applying guide boxes, substantially as described, to the tail stocks of lathes, which make a better, cheaper, and far more durable bearing than those made heretofore for such purposes.

BORING AND MORTISING CARRIAGE HUBS.—R. J. R. Stone, of Berlin, Ohio.—I claim the combination and arrangement of the chisel and quadrant lever, in the manner specified, for the purpose of boring out the mortise at any desired angle, as indicated by the index. I claim this in connection with the sliding frame in the manner and for the purpose set forth.

CARRIAGE BRAKES.—Joseph Sollenberger, of Higginsport, Ohio: I claim the mode of applying the fore and hind wheel rubbers, by means of the connections M and N, applied to the fore rubbers as described, and in connection therewith the connection, J, applied to the hind rubbers, as described, so that the fore wheels may be acted on in the rear, and the rear wheels in front, substantially as described.

APPARATUS FOR PAYING THE SEAMS OF VESSELS.—James W. Stoakes, of Milan, Ohio: I claim the construction of a rotary mop, by the combination of the two sectional disks, provided with hollow arms or axles, through which passes a bolt having a nut, by which the disks are secured together, and the mop retained in place at the periphery between the inside edges, or by any other means, substantially as set forth.

SUSPENDING EAVES TROUGHS.—Chauncy D. Woodruff, of Toledo, Ohio: I claim the mode of suspending and fastening eaves troughs as described.

SEED PLANTERS.—L. B. Fisher, of Coldwater, Mich.: I claim constructing the driving wheels of planters with cut rims and divided hubs, substantially as described, said hubs being made to traverse the driving shaft by means of forked levers operated by a screw or its equivalent, for regulating the alignment of the hills in a cross direction, as set forth.

I also claim the scraper in combination with the two pins and the two levers, arranged and operating substantially as described, for preserving a given space between the edge of the scraper and outer surface of the rim of the wheel, as specified.

SEED PLANTERS.—Jeremiah C. Gaston, of Reading, Ohio: I claim the reciprocating agitator, as set forth.

SEWING MACHINES.—Charles Miller, of St. Louis, Mo.: I claim giving the cloth or material being sewed, a movement laterally to the direction of the seam, between the successive stitchings or interlacings of the needle and shuttle threads, substantially as set forth, for the purpose of receiving different kinds of stitches or seams.

[See notice of this invention on page 268, Vol. 8.]

OPERATING HYDRAULIC RAMS.—Clark Polley, of May's Landing, N. J.: I claim the air tight box or chamber, having within it and in combination therewith, and with each other, as set forth, the hydraulic ram and pump, and having suitable pipes attached in such a manner as that when the apparatus is submerged, and the pump worked from above, the ram will be free to operate by the pressure and momentum of the water resting above it.

ARTIFICIAL LEGS.—David B. Marks, of New York City: I claim the combination of the rod which is attached to the foot, and moves upwards and downwards within the leg or lower part of the limb, the spring applied to the rod, and the curved bar, plate or way, attached to the thigh or upper part of the limb, the whole operating substantially as described, to lock the knee stiff, and control the position of the foot, until the ankle is bent, on throwing the body forward, and retain the foot in its bent position at the ankle, until the knee is again straightened, as set forth.

[This ingenious invention is illustrated in number 48, Vol. 8.]

BRICK MACHINES.—Seaman C. Ripley, of New York City: I do not claim broadly the use of a gauge for guiding the molds in entering under the grating, as such a gauge, provided with a weighted lever for throwing it back to its place on the backward movement of the fore bar, has been used in the machine of Collins B. Baker, patented March 22, 1850.

I claim throwing the gauge back to its place by means of a tail, or cam, or equivalent, upon which the fore bar acts on its backward movement, as described.

MACHINES FOR SPLITTING RATTANS—Joseph Sawyer, of South Royalston, Mass.: I claim the combination of the feed rollers with the cutter, constructed and operating as described.

MACHINES FOR SPLITTING RATTANS—A. M. Sawyer, of Templeton, Mass.: I claim the employment of a tubular spurred cutter, or its equivalent, in combination with a guide for holding and guiding the stick thereto, as described.

SEWING MACHINE—Wm. Wickersham, of Boston, Mass. I do not claim the mere duplication of a sewing machine or the placing of one of such machines by the side of or near to another, and similar machine, so as to perform two rows of stitches by the operation of both machines.

But I claim more properly in so combining with one sewing machine, having a thread carrier, or their mechanical equivalents, another or second needle, and a second hole in the thread carrier, or equivalents therefor, that by the action of the same needle-moving machinery, two needles are made to operate simultaneously, so as to perform at one and the same time, two parallel rows of stitches, with separate threads, substantially as specified.

BRITANNIA TEA AND COFFEE POTS—Robert W. Andrews, of Staffordsville, Conn.:—I claim a tea pot, coffee pot, or other vessel, composed of a supporting ledge, or base of iron, (or other metal which is not melted by ordinary degrees of fire heat) combined with a body of britannia metal, as set forth.

CONNECTING JOINTS OF AIR HEATING PIPES.—J. Young, of Franklin Furnace, Ohio: I claim forming a perfectly tight joint for air heating pipes, by boring out recesses in the ends of the pipes, the recesses being sufficiently large to receive a thimble, which is made of a more expensive metal than the pipes, and which thimble, upon being heated, will, in consequence of expanding more than the pipes, bind tight against the recesses in which it is fitted, and form a perfect tight joint, as described.

[This is a good improvement, and is noticed on page 140 of the present volume.]

MACHINES FOR DRILLING STONES—William C. Wright, of Boston, Mass.: I claim the combination of mechanism herein described, for operating the drill bar, consisting of two pairs of grippers, attached to rods, having slotted heads, which receive the wrists of two cranks, the said cranks being arranged diametrically opposite to each other, on a common axis, and the slots in the heads of the gripper rods being of such form as described, so as to cause one set of grippers to be always rising while the other pair are descending; but to cause a cessation of motion before every descent, in order to give time for the drill bar to fall, as herein set forth.

[A notice of this invention is published on page 108 of the present volume.]

HANGING GATES—Ashley Hotchkin, of Schenevus, N. Y.: I claim hanging a gate by means of two lower turning pivots, or pintles, working on separate step projections of a box, or frame, the upper end of the gate being steadied and carried by suitable rollers, (any number) or their equivalent, working or travelling in fixed grooves, channels, or spaces, so as to admit the gate opening either way,—the several parts being constructed, arranged, and operating, as described.

[This is a good improvement, and we hope the inventor will realize a proper remuneration for it.]

WATER CLOSETS.—Daniel Ryan & John Flanagan, of New York City,: We claim, first, dividing the chest or penstock, into two compartments, communicating with each other,—the division being made by means of a flanch, or its equivalent, by which a sufficiency of water is reserved within said chest, or penstock, after the supply has been stopped, to cover the opening, or mouth of the pipe, at the bottom of the bowl seat, and effectually prevents the escaping of effluvia into the apartments.

Second, we claim the sliding tube within the trunk, or cylinder, said tube being constructed, arranged, and operated as shown,—by which a direct communication is at all times cut off between the bowl seat and exit pipe, and at the same time the excrement allowed to pass into the exit pipe at the proper time.

SELFACTING RAILROAD SWITCHES—Joseph Wilson, of Hartford, Conn.: I do not claim the connection of a switch and a bar, by a jointed lever, so that the motion of one gives a corresponding motion to the other; nor do I claim to operate the switch by means of a bar forming part of one of the main track rails; nor do I claim to return the switch to its position by means of a spring and catch after it has been displaced by the pressure of the flange of the car wheel; but I limit my claim to the precise arrangement of the parts for operating the switch by means of the lateral pressure of the wheel flanges on the inner sides of the movable and fixed rails, when the cars are on the rails.

SEWING MACHINES—Christopher Hodgkins, of Boston-Mass. (assignor to Nehemiah Hunt): I claim constructing the horizontal needle of the angular form, as described; and making it to operate with respect to the vertical needle, and its eye, as explained.

WIRE HEDDLE EYES FOR LOOMS—Thomas Clegg, of North Andover, Mass. (assignor to himself and Nathaniel Stevens, of Andover, Mass): I do not claim a loom harness metallic eye, or eyelet, made by being stamped out of a piece of metal;—Nor do I claim a metallic eye, or heddle, formed by round wire, or wires twisted together:

But I do claim a loom harness metallic eye, made of round wire, or wires, twisted together and compressed and flattened in the twist of its wires, and directly at the top and bottom of its warp thread opening, as described.

APPARATUS FOR OPENING AND CLOSING GATES—Samuel G Dugdale, of Richmond, Ia. Additional to reissued letters, Jan 31, 1854: the nature of my improvement consists in hanging a pendulous lever provided with a notch, by which I cause the weight of the gate to be the means of holding the bottom to the point to which it is drawn, and at the same time holding the vertical lever down until the carriage has passed over it, thereby preventing any appendages that might be attached to said carriage, or vehicle, from catching said lever.

The application of a pendulous lever provided with a notch, or its equivalent, as set forth.

RE-ISSUE.

SHINGLE MACHINES—E. R. Morrison, of Troy, Pa. Originally Patented Nov. 22, 1853: I claim riving and carrying forward of the riven shingle, by the intermittently reciprocating movement of the riving knife stock, or frame, so as to be operated upon successively by the shaving and edging knives, said motion being imparted by the movement of the riving knife stock, through the intervention of the spring hooks, stops, or dogs, or their equivalents, as described.

NOTE.—In the above list of patents, eleven of the applications were prepared at the Scientific American Patent Agency. We think it is the largest list ever issued to our clients at one time. We congratulate them upon their favorable prospects, and urge them to use diligence in bringing out their inventions before the public. Now they are fresh and can be more easily disposed of if they possses value.

Explosion of a Steamboat Boiler.--The New Law.

On the 17th ult., the steamboat "Kate Kearney" exploded one of her boilers while lying at the dock in St. Louis, Mo., by which catastrophe four persons were instantly killed, and twenty severely scalded, some of whom have since died. We have seen it stated that this explosion was caused by gross carelessness. The St. Louis "Republican" states that the U. S. District Attorney, Thomas C. Reynolds, has entered into a vigorous prosecution of the parties to whose carelessness and recklessness the deplorable catastrophe is attributed. The Captain has been arrested and required to enter into bonds of $5,000 for his appearance at trial. One of the Deputy Marshals was subsequently sent to Alton with a warrant for the arrest of the engineer, Albert Hardy. Both of these officers of the "Kearney" will be prosecuted for manslaughter under the Steamboat Law. The affidavit of carelessness was made by the Inspectors, and is levelled exclusively against the Captain and Engineer.

It appears to us that the steamboat Inspectors under the New Law for that District are also blamable, and their conduct should likewise be subjected to a rigid examination. The "Kate Kearney" was an old boat, and the Louisville "Evening News" states that part of the boiler which was blown on the Levee exhibited an old fracture, and was much incrusted inside. The same boiler had collapsed once before, in 1851, and was merely mended, as testified to by the Captain and one of the owners, and it had been in use altogether for six years. How the Inspectors ever came to test this boiler, as it is stated they did, and allow it to pass, is something that requires explanation. It makes no matter how many good laws may be enacted for the preservation of life from explosions; they will all be no better than blanks on the statute book, if the officers appointed to carry them out, neglect to do their duty. The constant tendency of our institutions has been to appoint men to all offices from political party motives, not for personal merit. This party policy should be abolished with respect to such offices as those of Inspectors under the Steamboat Law.

One great cause of explosions on our western boats, we see, has been brought to light by the investigation of the local Inspectors of Cincinnati into the causes of the collapse of a flue in a boiler of the steamer "Zach. Taylor," by which three lives were lost and several persons injured. Among other things, the testimony which has been laid before them shows that the iron of which the flues were made, instead of being uniformly one-fourth of an inch in thickness, had the appearance of piled iron, not welded in rolling, and it varied in thickness as much as thirty per cent.—being in some places little more than one-eighth of an inch thick.

Now, as a boiler can only be of the strength of the weakest part of it, every boiler should be inspected with great exactness and care. If the Inspectors do not do this, they, above all other persons, deserve to be severely punished.

Another Terrible Steam Boiler Explosion.

On the 2nd inst. a steam boiler exploded with terrific violence at the car factory of Messrs. Fales & Gray, Hartford, Conn., by which nine persons were instantly killed, and about twenty others severely wounded. The building containing it was destroyed, and much other damage done. The boiler which exploded was nearly new, made of the best materials, was five feet in diameter, and twenty-four feet long. From the evidence presented before the Coroner's Jury, we are of the opinion that the cause of the explosion was allowing the water in the boiler to get below the fire line of the flue, whereby it—the boiler—became red hot, and weak at the fire line, and when cold water was let in, the steam began to generate so rapidly that the metal gave way—exploded—scattering death and destruction around. It seems that the boiler had five flues, which were carried pretty high, thereby increasing the danger, and requiring greater attention.

It has been suggested to us that government should offer a suitable reward for some invention that will be a perfect preventive of steam boiler explosions. We must say that the cause of steam boiler explosions is not a mystery; it is well known, and such catastrophies can all be prevented if men are only cautions, careful, and attentive. We seldom hear of a steam boiler exploding in France. We believe that no more than two boilers have exploded in that country in twenty years. This has not been owing to any wonderful application of apparatus, or a superior mode of constructing French boilers, but simply because low pressure steam is generally used, and a good and rigid system of steam boiler inspection enforced. The most perfect means to prevent explosions is at the command of all, but they are not applied. The pressure of the steam on the exploded boiler was 80 lbs. to the square inch, or equal to something more than five tons and a half on every square foot. However strong the iron of the boiler might have been when cold, it became very weak when highly heated.

Professor Agassiz

In his lectures before the Lowell Institute, in Boston, says that the human race existed on the globe a hundred and fifty thousand years ago. This he proves to his own satisfaction.—He points ont differences in the physical structures of the different races of men, greater than those existing between the orang-outang and the chimpanzee—animals which naturalists regard as different species. He concludes, therefore, that men sprang from different stocks.—[Exchange.

[We have seen many such opinions accredited to Prof. Agassiz, but have never been able to see a correct and certified report of his opinions.

Remedy for Chilblains.

Take a sufficient quantity of hot water in a tub to bathe the feet in, and add a lye made of wood ashes or potash, until the water feels quite soft and slippery. Soak the feet which are troubled with chilblains thoroughly in this, then rub them with a towel until they are perfectly dry. After this rub them over lightly with the spirits of turpentine, and it will at once stay the disagreeable sensations arising from the chilblains. Follow up this operation for a few evenings, and a cure will assuredly be effected, as I have proved by experience.

J. M. T.

Irvine, Pa.

Reaping Machines.

We have in our possession some very rare and valuable information in regard to the progress of this class of agricultural implements, and shall present it in a series of articles, together with illustrations, as soon as we can find pace for them.

Hobb's Lock Picked.

The famous American Lock, known in England by the above name, has, it is stated by the London papers, been picked at last by a Cockney. We have not yet received an account of the particulars connected with this affair.

The locomotive "Manchester" exploded at Hudson, on the Hudson River Railroad, on the 10th inst. The engineer was instantly killed.

A Bill is now before the Legislature of this State, making it obligatory on all ferry steamboats to carry life preservers and other safety apparatus.

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New Inventions.

Alarm Gauge for Steam Boilers.

J. Hopkinson Smith, of the city of Baltimore, has taken measures to secure a patent for an improved alarm water gauge for steam boilers. The nature of the invention consists in attaching to a float a metal tube, which works directly through a stuffing box on the top of the boiler, and has an opening on one side, which is at such a hight that while the water is at a safe level, it is either within or above the stuffing box, but when the water falls to a dangerous level, it enters the steam space in the boiler, and allows the steam to pass through it into the tube and up to the whistle at its top, thus alarming the engineer, and informing him of the low state of water in the boiler. To the bottom of the float there is attached a horizontal blade, which tends to keep it (the float) steady in the water, and prevents it from being much affected with the foaming and boiling of the water.

Improvement in Cotton Gin Saws.

J. H. Watson, of Palmyria, Ga., has applied for a patent on Cotton Gin Saws. The saws now in common use for cotton gins have the spaces between the teeth made with acute angular bottoms, which is the cause of much cotton being cut or *napped*, and drawn or twisted into kinks. They are also the cause of considerable difficulty in stripping or clearing the saws by the brushes. The object of this improvement is to obviate the above evils, the spaces therefore between the teeth of the improved saws are made with wide bottoms either round or square—the round are preferred. This improvement obviates the napping of the cotton, allows it to be easier blown off from the saws by the brushes, and gins it faster and better.

New Railroad Switch.

An improvement in the operation of railroad switches, has been made by Asa A. Simmons, Narrowsburg, N. Y. It consists in attaching one end of the ordinary connecting rod of a switch to a circular plate at any point, between the center of said plate and its periphery, according to the length of stroke required. The circular plate is attached to one end of a horizontal shaft, at the opposite end of which there is a lever, by which the peculiar plate and shaft are turned, and the connecting rod and switch moved. An index is secured to the circular plate, for the purpose of denoting the exact position of the switch. Measures have been taken to secure a patent.

Machine for Softening Flax.

Robert Boyack, of Poughkeepsie, N. Y., has invented an improved machine for softening flax. The improvements consist in having a vertical reciprocating plate with a slot through it, which works between two pairs of fluted rollers. The flax to be operated upon and softened passes from a feed trough, between one pair of the fluted rollers and through the slot in the reciprocating plate, and from thence through the other pair of fluted rollers. The reciprocating plate subjects the flax to a rubbing frictional action, which renders it soft and pliable, without injury to its fiber. Measures have been taken to secure a patent.

Castors or Foot Rollers.

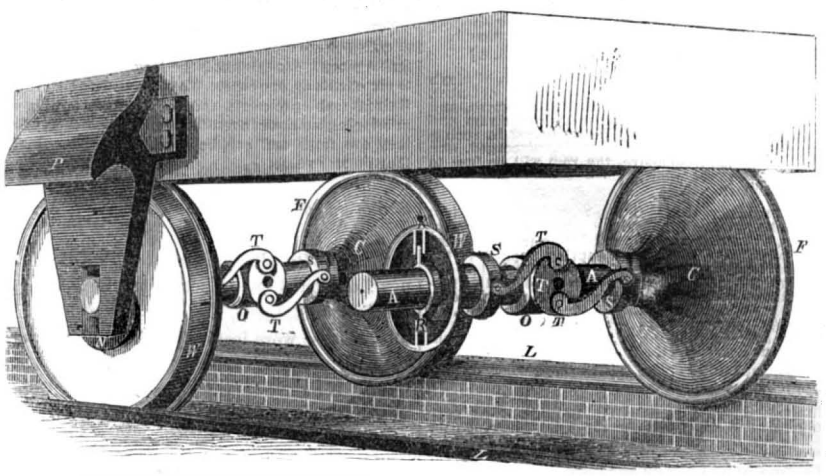
Samuel Barker, of this city, has taken measures to secure a patent for an improvement in Castors, which is of no small importance for heavy bodies, such as iron safes, to which they may be applied. The improvement consists in having the fork in which the roller is placed work or rotate within a socket or guard, the shoulder of the fork having a washer resting upon it to prevent friction; the washer is within the guard.

Improved Brick Kiln.

J. S. Speights, of Baltimore, Md., has made a useful improvement in Brick Kilns, for which he has taken measures to secure a patent. The object of the improvement is to effect the burning of bricks in kilns by burning coal in a more perfect and economical manner. The fire grates and air passages are arranged in such a manner that very perfect combustion, and a saving of the heat are obtained. The combustion can be controlled in all parts of the kiln, and the heat can be concentrated on any part of it. These are very important and necessary regulations to a perfect kiln. The use of coals, so as to obtain advantages from this fuel, superior to those which can be derived from wood, for burning bricks, presents important advantages to all those who manufacture them. The use of coal for burning brick is not new; the improvements only relate to the better and more economical use of such fuel.

VARIABLE GAUGE WHEELS FOR RAILROAD CARS.

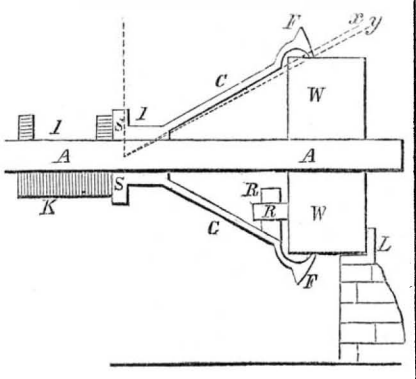
Figure 1.



The annexed engravings represent an improvement on Wheels for Railroad Cars, invented by Messrs. W. W. & J. A. Solliday, of Philadelphia, Pa., for which measures have been taken to secure a patent. The improvement consists in making the flanges of wheels movable on the line of the axle, and this is done in the following manner, figure 1 being a perspective view, and fig. 2 a transverse section, the same letters referring to like parts on both figures:—

A hollow conical case, or its equivalent, is added to an ordinary wheel, and is made narrowing from the flange to the middle of the axle, and it encloses the latter at that point. As presented in the figures, the wheel, W, and case, C, are cast together, and fitted to the axle A so as to move lengthwise upon it, between a strong collar, O, in the middle, and another, N, at the end of the axle. Each wheel is allowed sufficient play between these collars, to suit the different gauges of track for which the cars are intended to be used. Upon the center of the

Fig. 2.



collar, O a double toggle, T, is applied for moving each pair of wheels backwards or forwards simultaneously upon the axle. In practice, however, it may be found that converging grooved rails upon a track of sufficient length will answer the purpose as well. That part of each case, S, near the central collar, is made to project, in order that a suitable key may be applied to clamp each pair of cars together to the narrow, and key them apart to the widest gauge; said key having cross-cuts fitting the cases and axle respectively. Suitable pits under the track, will give access for shifting the wheels and introducing the key. Strong projections, P, must be placed upon the side of the truck for sustaining the weight of the car upon a movable track at the station, while the wheels are being shifted, but converging grooved rails may supersede the necessity of this latter arrangement also. In the section, fig. 2, the wheel and case are made separate from each other, so that the flange and case to which it is joined may slide in and out upon the wheel rim. The wheels in this instance are keyed to the axle in the ordinary way. The cases are provided with holes for discharging dust, &c. In fig. 1 the wheels are shown as made to turn the axle by means of carriers, R; in fig. 2 such carriers are made to move the cases simultaneously with the wheels and axle. Rails shaped like the letter L must be made to support the outside of the wheel rims, while the flanges are being shifted, in case they are movable upon the rims of the wheels. In fig. 2, W is the wheel; C is the case; S is the projection upon the case, F; L is the flange rail; R is the carrier; K is the key introduced between the projections upon the cases and over the axle with a space (1) fitting the case behind the projections at I, when used as a clamp. The inventors say:—

"The greatly increased width of that part of the wheels bearing upon the axle, in fig. 1, will make them nearly equal to keyed wheels in their running qualities. The waste play of the flange between tracks will not be great; the difference being the sines of the angles expressed by the dotted lines, *x y*, fig. 2, drawn from a point in the middle of the axle to the flange itself, and upon a base crossing the axle at right angles through that point. The space between the lines represents the play necessary to allow the flanges to move freely across the rims of the wheels. The additional weight of the wheels will be equally balanced upon their centers, thus causing but little increase in the wearing of the journals."

For more information address Messrs. Solliday, No. 186 Callowhill street, Philadelphia.

Recent Foreign Inventions.

Sugar Moulds—Henry Bessemer, of London, pat.—The inventor constructs cylindrical sugar-loaf molds having a movable bottom, so that the syrups may drain off from a surface whose area is equal to the body of the mold, whereby the mould may be made of a much greater hight, because this increased area of outlet will allow the syrups to drain off quickly, which the hydrostatic pressure of a tall column also materially assists; this increased capacity of the mold will render it much too heavy to be handled by the workmen in the usual way. Mr. Bessemer, therefore, prefers to make them fixtures, or movable only with revolving apparatus, somewhat like a turn-table, and instead of detaching the loaf from the mold by a blow, he employs an hydraulic press or other suitable mechanical force to push out the loaf from the mold.

India Rubber.—Charles Goodyear, formerly of this city, but now residing near London, has recently taken out five patents in England for india rubber good manufactures, with which his name is more prominent than that of any other man.

1. The first patent is applicable to coarse fabrics, the object being to render it water-proof without impregnating and filling up the interstices. It consists in passing a piece of cloth with undissolved india rubber between two heated rollers driven with unequal velocities, by which means a thin coat is caused to adhere to the prominent parts of the surface of the cloth. After this a very thin sheet of india rubber is made to adhere to it by pressure between two other rollers.

2. The second patent is for making substitutes for bristles out of india rubber, so as to fit them for making brushes. The india rubber is combined with sulphur and a metallic oxyde, then the mass subjected to heat until it becomes somewhat hard, when it is forced through perforations in a metal plate, forming bristles, they are hardened to the proper degree afterwards by heat.

3. The third patent is for manufacturing pens, pencils, and instruments used for writing and drawing. The pens are used for writing with ink, but the pencils are merely for marking on slates. These are made by combining slate powder with india rubber, then moulding and hardening them. He also combines slate powder with sheets of india rubber and forms marking slates.

4. The fourth patent is for purifying indi rubber, by subjecting it in a finely subdivided state to the action of an alkaline solution and then washing it well.

5. The fifth patent is for the manufacture of beds, seats, and other hollow flexible articles. The invention consists in employing knit or looped fabrics to contain air. Two surfaces of such fabrics are coated with india rubber cement, and are made to adhere at intervals, but where the hollow cells are to be, paper is interposed to prevent adhesion, and bands of non-elastic fabrics are cemented between the two surfaces to separate the cells. The cells may all be connected by a vulcanized india rubber tube and be inflated, thus forming an air mattrass or an air cushion. Such beds and cushions we think will not be very comfortable.

Spontaneous Combustion.

The Farmers' Factory, at McMinville, about 25 miles below Sparta, in this State, was burnt down on Sunday, 5th of this month, caused, as is said, by the spontaneous combustion of a pile of clean cotton waste, which had been lying in a corner of the mill for two years. Will cotton in a dry place, I mean card strippings, that are perfectly dry and free from oil, ignite spontaneously? I don't believe it will. Do you think a chance bunch of oily waste that had been used in cleaning machinery would cause it to ignite, or to be still more inquisitive, will cotton saturated with sperm or lard oil ignite spontaneously, and if so, how long would it take to do so in a dry place, such as a cotton mill heated by steam? I know that linseed oil will, and I have often heard of waste houses taking fire where there was no linseed oil.

The fire in the Farmers' Factory broke out at four o'clock P. M., whilst the watchman and another were in the room. They were aroused by a noise similar to a hard blast of wind striking one side of the house, with a stream of fire shooting from the center of the waste pile. The flames spread with such rapidity that they were unable to save anything but a few bales of cloth, the books were in an upper room, and were lost. No insurance. Loss, $95,000.

J. T. K.

Sparta, Tenn., Feb. 21st, 1854.

[Cotton perfectly free from oil would not ignite spontaneously, but a very small quantity of waste cotton, perhaps a handful, which had been used to wipe the machinery, and thrown into the heap, might have set it all on fire. On one occasion we saw 200 lbs. of cotton yarn take fire spontaneously, which had been saturated with a preparation of olive oil and soda, and had been perfectly dried. The kind of oil is not material. Persons in cotton factories should be very careful of waste cotton, which has been used for wiping the machinery.—Ed.

Superintendent of the New York and Erie Railroad.

We understand that D. C. McCallum, of Owego, has been appointed General Superintendent of this great railroad. The news gives us no small amount of pleasure; he is an able and an upright man, combining qualities of the very highest order to enable him to fill this situation with distinguished ability. He is a practical man, of sound judgment, great ingenuity, and assiduity.

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Scientific American.

NEW YORK, MARCH 18, 1854.

Our New Half Volume.

This number being the first of a new half volume, and as we always have had a large addition of new subscribers at such periods, we commence this number the same as if it were the beginning of a new volume; that is, so far as it relates to the commencement of a new series of articles. It is therefore a very excellent time for persons to become new subscribers, as they will have, in this volume, the best record in the world, of the progress of American Inventions and Discoveries for the next six months. We will also publish a series of miscellaneous illustrated articles in it, which we are confident will afford much gratification and impart a great deal of new and useful information. It affords us much pleasure to acknowledge during the past few weeks, an astonishing large increase of new subscribers.

Needful Discoveries.

The New York "Tribune" of the third inst., contained an article with the above caption, in which two new discoveries were suggested. It says:—"in order effectually to advance our civilization two discoveries in a different department are now urgently required. The first is a method of hardening metal, so that stone may be cut by it with the same celerity and ease, as we now cut wood with steel. It must be supposed that the rocks, which form so large a part of the crust and even of the surface of the globe were intended for the uses of man.—Wherever great wealth accumulates, either in the hands of a sovereign or a people, you may see its representation in their enduring structures of stone."

It then speaks very truly of the unenduring nature of wooden structures, and their liability to take fire, but the remedy which it suggests is founded in error. It says: "It seems within the limits of scientific possibility that a method may be discovered of hardening some of the present metals, or an amalgamation of some of them, so that a boulder from the side of a mountain may be sawed into blocks, pillars, and beams by means of machinery, similar to that used for reducing pine logs to planks and boards. If iron upon being heated in carbon can be made to change the combination of its particles so as to become capable of cutting simple iron, as readily as old cheese, may not an additional equivalent of carbon, or the addition of some known or unknown substance, so increase its tenacity and hardness as to make it capable of sawing granite? If not, have any other metals the property of becoming so indurated? It is said that the ancient Peruvians wrought stone with tools of tempered copper. Shall we never regain this lost art?"

We have heard a great deal of the copper tools of the ancient Egyptians, as well as Peruvians, but we must say, that they did not at all equal our modern steel tools in any respect; those who talk so much of ancient copper tools, and the *lost art* of tempering, betray much ignorance. The plain idea presented in the above, as a suggested remedy for cutting stones like sticks, is simply the use of a harder metal than any which is now used in stone dressing. But suppose we had a metal ten times harder than any we now have, we could not cut stone with it as easily as we now can cut wood. The great obstacle to the cutting of stone with ease, lies in the nature of the material to be reduced and shaped. Its particles possess more cohesion, and are much harder than those of wood; they therefore require the exercise of a greater amount of mechanical force for their separation, either by cutting or abrasion. The needful discovery to effect this, has been made and applied; it is steam power. Perhaps, the most useful discovery, as a substitute for wooden structures, is a strong cheap material, like cast iron, which is capable of being moulded into any form without cutting at all. It will be a happy day for our citizens, especially in large cities, when all the buildings will be composed of cast iron in place of stones, sticks, mortar and mud.

Respecting the other desirable discovery it says:—"The other great desideratum is the production of heat without combustion. The accumulation of population and power in the world has been for many centuries in the colder latitudes. The greater part of the habitable globe, best adapted to support human life, lies under the colder zones, there the homes of the great majority of the race must continue to be. Indeed, the use of fire seems to have been one of the earliest steps towards civilization. In all the northern States of this Union more is annually expended for fuel than for bread. It would almost seem to be one of the duties of the Creator, who had fitted up this planet for the abode of his creatures, to ventilate it with air of such a temperature as would be congenial to life. At any rate there must be in the mystery of his laws better methods of producing heat than the combustion of trees, or of coal, sparsely stored in the almost inaccessible bowels of the earth. Heat exists in all known substances. It gives to liquids and fluids their form, and chemistry has discovered the method of releasing it from each and making it available. It is a product of friction and of the combination of many common substances. In the human organization it is generated by the combustion of atmospheric air. It is above us in the clouds, that retain their vapory constitution through the winter, and beneath us in the earth, that keeps up its equable temperature through all seasons alike. Would not the same amount of energetic experiment and patient study that has been required to perfect the steam engine, if applied to the study of these laws, obtain results of incomprehensible importance and influence?"

This fling at the duties of the Great Creator would never have been uttered by one who had drank deeply at the well of science.

The Great Creator has fitted up this world and does ventilate it with air congenial to life; he has also provided abundant means; and has established the most beautiful and simple laws, for the health and comfort of man. If the Great Creator had provided only for an elevated temperature for domestic and manufacturing purposes, by the development of heat from friction, man would be no better than the brutes which lie in the cave or the jungle, and know not the blessings of combustion. We feel grateful to the Creator for the beautiful law which he has established, for the development of heat by combustion. None can be more simple, and none require less labor from man in fulfilling the conditions necessary to its perfect realization.—We pity those who cannot see the beautiful adaptation in the laws of combustion to the wants and happiness of man, under all conditions, and in every clime. And when we reflect that the materials belonging to our globe, to produce combustion, are illimitable, we wonder at the spirit which called forth the above. Heat is produced by friction, and combustion—these two processes cover all the rest. It is not produced in man, as stated above, by the combustion of atmospheric air, but by that of the carbon and hydrogen introduced into our system in the shape of food and drink. It is estimated that the heat given off by a full grown man in 24 hours, is sufficient to raise 63 lbs. of water, from 32° F. up to the boiling point; the greatest part of this heat is due to the combustion of our food, but some is also due to the friction caused by the action of the muscles and the nerves. There is no country in the world where the expense of fuel is equal to that of food, but still, the expense of fuel in the coldest parts of our northern States is very great.—and this, let us say, is more in consequence of the violation of well known laws, than ignorance of them; we allude to the want of exercise in the open air, and the general immersion of persons in hot unventilated apartments. The very fact admitted above, that the colder regions appear to be the cradle of races and nations, is perfect evidence that the Creator has produced the best and most congenial atmospheric currents for general human happiness, and abundant experiments have been made with frictional electricity, and the friction of bodies, to satisfy any clear-minded man, that no amount of experiment or study, can develope heat from these means so cheaply as by combustion. At present we need not dwell at greater length upon this subject; we will only say that simple combustion is a subject which has always afforded us deep cause for wonder and admiration; it is one of the most simple, yet most mysterious and sublime of nature's laws.

Value of Patented Improvements.

Within the past year we have noticed with much pleasure the increased attention which has been paid to patented inventions by men of capital. Several joint-stock companies have been formed for the manufacture and sale of good improvements, and we have no doubt that more attention will be given to this branch of industry in future. We could instance a great number of cases where inventors have realized a handsome competence from the sale of their patents within the past eighteen months, and it is by no means an uninviting field for men of means to undertake the management of good inventions.

The cost of an application for a patent rarely exceeds sixty dollars; and if the case is rejected, twenty dollars of this amount is returnable by law. Surely this is taking a very slender risk compared to the advantages likely to result from the sale of the invention if the patent is granted. If the aggregate number of patents issued did not directly or indirectly benefit the inventor, there would be less activity in this branch, and one reason why so many do little or nothing with their inventions, is owing to a want of energy in bringing them before the public.

We are always prepared to advise with applicants in regard to the novelty of their contrivances; and as managers of a Patent Agency the most extensive in the world, our facilities are not excelled, if equalled, by any other concern. Thousands of dollars have annually passed through our hands for disbursement, both at home and abroad, and not an instance can be produced where we have not faithfully accounted for every dollar entrusted to our care.

Starch Patent Extension Refused.

It will be remembered by our readers that we published, in No. 25, the specification of the patent of Orlando Jones, for making starch, who has petitioned for its extension, the official advertisement of which will be found in another column of this number. An application was made some time since for the extension of Jones' English patent; this was heard before the Lords of the Privy Council, in London, on the 8th of last month, and was decided in the negative—the extension was refused.

We learn by the "London Mechanics' Magazine," that in 1842 the inventor made a disclaimer in England, in consequence of a patent having been granted in 1824 to one Thomas Wickham, for the use of a solution of alkali, by subjecting rice to its action before it was ground, while all that remained of the patent of Jones, was for the use of the alkaline solution after the rice was ground.

The Privy Council, without going into any evidence, decided that there was not sufficient merit to warrant an extension, and whatever merit there was, the credit belonged to another, and the applicants were ordered to pay £100 to liquidate the expenses of those who opposed the extension, as there was no grounds at all for them (the applicants) making the application. This appears to be a peculiar decision, and the first of its kind, we believe, in any country, namely, awarding costs to those who opposed the application for the extension of a patent.

The India Rubber Case Again.

Three weeks ago (on page 187) we noticed the granting of an injunction by Judge Betts, against the New England Car Spring Co., for an infringement of the patent of Edwin M. Chaffee, the extended term of which H. H. Day had purchased of the patentee. Since that time the defendants in that suit have applied to the Court to dissolve the injunction, which was only a temporary one. We do not know at present if the motion to dissolve will be granted, but we would state that this Company claims to have a title to manufacture car springs of india rubber by a license from Goodyear and Judson, who claim to have a superior title to the patent of Chaffee. It seems to us that our U. S. Courts are clumsy, elastic, and interminable in their actions and operations. There seems to be no power in them for bringing matters to a final issue, or else india rubber is too elastic for them to grapple with. No sooner does a case seem to be settled and the india rubber contracted to its natural dimensions, than some one gives it a long pull and a strong pull, and out it is drawn again before the courts to a length as endless as that represented by the ancients in the figure of a serpent swallowing its tail. In the decision of Judge Betts, it is stated that H. H. Day paid E. M. Chaffee, $11,000 for this extended patent, which extension was granted in 1850 by Mr. Ewbank. The most curious part of this transaction perhaps is that H. H. Day was the most active opponent to the extension of the patent, and even after it was granted, he published a circular, with the opinions of a number of lawyers attached, asserting that it was granted illegally. At present he seems to consider it one of the most legal extension ever granted—worth at least $11,000. Well, everything about this india rubber case partakes of the nature of the article itself; it is strong, elastic, durable, impervious to moisture, can stand a high degree of heat when sulphurized, it vulcanizes the courts, and electrifies the lawyers.

Telegraph Fire Alarm and Steam Fire Engines.

During the past winter our city has suffered severely by extensive conflagrations; these calamities naturally incite us to inquire "can no proper remedy be provided for them?" Although we believe conflagrations cannot be prevented entirely, we have no doubt but they may be greatly lessened in extent and frequency. In Boston they have a telegraph fire-alarm system, by which, in a second of time, information is sent to almost every engine house, of the exact situation of a fire when it breaks out, so that the firemen can dash off in an instant to the point of action. This system has been the means of preventing many disastrous fires in that city. Let it be adopted in New York, and it will save the city some millions every year.

In Cincinnati there are one or two steam fire engines, which are stated to be very effective, and capable of throwing such heavy columns of water rapidly on a fire, as to drown it out in a very short period. Let our Common Council get one of these engines built, and give it a fair trial, and if it prove to be half as good as has been represented, it will save a thousand times more than its expense, in a single season. Our city and the insurance companies can afford to expend a very large amount for the prevention of extensive fires, and they should not act penny wise and pound foolish to do so, but at once adopt more effective and energetic measures to accomplish such ends. We suppose that $5,000,000 will not cover the losses caused by fires in this city during the past year; the one-tenth of this amount expended judiciously, will, we believe, prevent five out of every six fires which break out from becoming large and destructive.

The Independent.

Owing to the destruction of the publishing office of the "Independent" by fire, some of the subscribers will doubtless fail to receive their paper. Those who do not receive it are requested to inform the publisher, Mr. Joseph H. Ladd, No. 22 Beekman-street, New York, as soon as possible, and also state the time, as shown by their receipts, when their subscriptions expire. Exchange papers and the press generally will confer a great favor by publishing this notice.

Pure Milk.

A bill has been introduced into the Legislature of New York, for the incorporation of a company to supply this city with pure milk.—The cows of the company are to be fed on grass, grain, &c.—no distillery slops. It is scarcely possible to obtain any pure milk at present; the milk pedlar's best grass field is a water hydrant.

We are obliged to Hon. F. B. Cutting, Hon. S. A. Douglass, Hon. W. H. Seward, and Hon. H. Walbridge, for Congressional favors.

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Application of Heat to Produce Steam or Evaporation.

The comparative effect of heat to produce steam in a boiler depends upon the ratio of the absorbing and transmitting power to the velocity of the escaping products of combustion.—For if the velocity be greater than the absorption and transmisssion of the passing heat to the water, then there will be a corresponding loss of heat. In the locomotive boiler with a rapidly escaping current only from 1-10 to 1-16 of the absorbing surface is by direct contact at ordinary speeds of the engine, and the remainder at right angles to the escaping current of heat. At high velocities the surface of contact will be inereased to about ½ or ⅓, whilst the velocity of the escaping gases will be also increased, a decreased length of tubes. Therefore as the velocity is increased the economy of fuel is decreased, from the failure of the absorbing transmitting power of the boilers to convey more heat in less time to the water.

The comparative heat transmitted by conduction, radiation, and convection may be tested by alternately placing a thermometer in contact with the flame of a candle, next by its side, then over the top of the flame, and noting the temperature at each of the three positions. Or if the hand be cautiously substituted where a thermometer may not be convenient, the respective differences will be sensibly indicated, and give a clear idea of the heat lost by convection, when its velocity is considerable, and the absorbing space limited. In this respect long boilers have an evident advantage over shorter boilers, where the diameters of the tubes do not offer sensible obstruction, for the largest portion of locomotive heating surface is on the worst or radiatory portions, at slow velocities, but decreasing as the increase of velocity extends the flames through the tubes. The experiments made by Mr. G. Stephenson, many years ago, showing the comparative evaporative ratio between the fire box and tubes of an engine at rest,as 3 to 1, would scarcely apply to an engine at very high speeds, since the relative conducting or radiating surfaces are not uniform, but vary with the velocity of the engine and heating power of the fuel. With a low velocity these surfaces might be more uniform, if the flame acted only on the fire-box.

The economical evaporation of water into steam depends therefore, first, upon perfect combustion; and, secondly, upon the absorbing and transmitting power of the boiler.

Where the powers are equal, the effects would be in the ratio of the surfaces of conducted and radiated heat, but where unequal, in the ratio of their transmitting power only.—Careful management of the fire to prevent "air holes" burning through in places, a due regard to the air-admission spaces being uniform, and a steady regular supply of fuel, have considerable effects upon the economical results from any boiler. A clear level fire, kept fed by regular-sized pieces of fuel and the fire-grate kept free from clinkers, all contribute to economy, and should be practiced. To aid the fireman or driver in their duties, as well as for the higher objects of research, there should be in every locomotive boiler one glass pane in the fire door, and one in the smoke-box door, that both the fire and the state of the escaping heat might be seen without opening either door, until such was really necessary. The chilly effect of opening the fire door in checking the production of steam is well known, and might be so far avoided whilst the experienced eye would soon detect whether combustion was or was not perfect, and act accordingly. There is no practical difficulty in doing so, for it has been done by our best experimenters, and, of course, could be done in daily practice with good results. A good self-acting feeder of fuel is desirable.—[J. Sewell on Steam and Locomotion.

Underground Telegraph.

During the cold weather experienced in Paris in the latter part of December and in the beginning of the present year, the electro-magnetic telegraphs were much interrupted from snow and ice, while the submarine telegraph rendered uninterrupted service. To avoid these difficulties, the administration have determined to place the wires between Paris and Calais under the ground. The submarine line continues to work well.

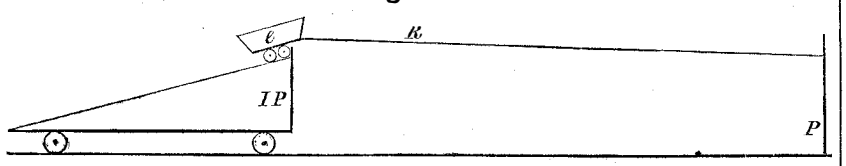
Water Wheels---Article 1.

Two of my correspondents have written to me for an opinion of the answer to your correspondent, "W. A. S.," in Volume 9, page 15. One of them wishes me to give you my views, as I did to him, and says you will be puzzled to find obscurity.

I illustrate it thus: suppose an incline plane, figure 1, 16 feet long, and 4 feet high, be placed on a perfect level railroad, on rollers, thus: I P is the incline plane; *e* is the car of twice the weight of the inclined plane; the car with the rope, R, fastened to the post, P, will hold the car from descending the plane. Is it not an axiom that the incline plane will move 16 feet, while the car by its gravity descends four feet?

Now to apply this to a Parker wheel, we will suppose a helical sluice, figure 2, under a horizontal wheel, 32 inches in diameter, with six

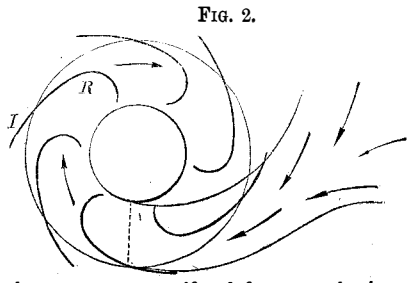
Figure 1.



issues, consequently the bucket (so called) is 16 inches from the end at the issue, I, to the radial curve, R, the issues 4 inches wide radially, (being in proportion to figure 1.)

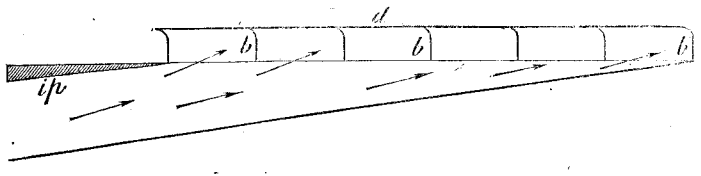
The circle cutting the center of the issues is the inside of the outer cylinder; the circle within the inner end of the buckets is the inner cylinder. These two cylinders confine the water entering the sluice in the course of the arrows up the helix, the water impinges on the bucket from where the bucket crosses anglingly the inside of the outer cylinder, producing motion to the wheel by its percussive force. Inertia moves the water radially, and produces

FIG. 2.



what we term centrifugal force on the inner curve of the bucket; now is it not evident that the wheel must move the entire length of the radial inclination of the bucket, while the water in its velocity passes radially 4 inches? When the wheel is only moving with its own weight the radial motion of the water will be but very little changed. And if we examine the ninth experiment of the third table of the report of the Franklin Institute, we find the water moved 17·76 feet velocity through the issue in one second of time, and the periphery of the wheel

Figure 3.



descends 4 feet, then we have $16 \times 100 = 1600$ momentum produced from $200 \times 4 = 800$ momentum. Anything that we have said in reference to the velocity of water and the wheel, has been viewed like the question of a free body striking an object. We have never known the piston of any steam engine to move with a greater velocity than the steam which propelled it. We are well aware that the periphery of a wheel may have a higher velocity than the water which moves the wheel, but the periphery of a wheel is only a part of *the wheel*. A water wheel is like a capstan; the handspikes or levers of the latter represent the buckets or arms of the former. The power of the water may be applied at any part of the arms, but will that part of the arm at which it is applied move with a higher velocity than the moving force. That is the simple question. A wheel 32 inches in diameter moving at the rate of 30 revolutions per minute, has a peripherical velocity of 251·32720 feet per minute, but the surface velocity of the wheel at 8 inches from the center is only 125·66360 feet per minute, and at 2 inches from the center it is only 31·41590 feet per minute. Water acting upon the bucket of a wheel of 36 inches diameter at 8 inches from the center, and having a velocity of 125·66360 per minute, if it communicated all its velocity to the wheel would give its periphery a speed of 251·32720 per minute. This is very plain, and no one will dispute it.

moved 26·4355 feet, or 48·85 per cent. faster than the actual discharge, and returned more than 71 per cent. in effect.

Figure 3 is an elevated view of the helix and wheel, supposing both to be extended in a straight line, the arrows represent the direction of the water, and exhibit the fact of each bucket being supplied simultaneously. The inclination of the sluice is in accordance with one for 96 square inches area of issue and inlet. The upper horizontal line represents the edge of the disk or head of the wheel in a line, *d*. The vertical lines with the curve of a quadrant represent the buckets, *b*, that receive the impulse of the water; *i p* is the edge view of the injunction piece, the sharp edge is radially with the dotted line across the sluice, figure 2, which brings the lower and upper currents of the water together, in the most smooth and gentle manner possible. Is it not evident the wheel must run at the periphery faster than the discharge water, to let the water pass radially through the issue? JAMES SLOAN.

Sloan's Mills, Shelby Co., Ky., Feb. 1854.

[The remarks of ours to which our correspondent refers, related to the velocity of a working water wheel like Parker's, running with a higher velocity than the water which propels it. We must say that we want some clearer explanation than any yet furnished. In relation to the question, "Is it not an axiom that the incline plane will move 16 feet while the car descends 4 feet." We say it is not an axiom. If according to the proposition a car of 200 lbs. weight moves an inclined plane carriage of 100 lbs. weight 16 feet, while the car

Decimal Weights and Measures.

A petition, drawn up by M. Vattemare, has been addressed to the American Senate. Its purpose is to induce that body to examine the French metrical decimal system for weights and measures, and adopt it, or a similar one, in the United States. In France, the monetary system is decimal, and has been since the revolution of '93; the thermometer is decimal, since Napoleon established the centrigrade; and measures of length, surface, solidity, capacity and weight, have been obligatory decimal since 1840.

We hope Congress will give the subject the attention it really deserves.

Breakage of Mills.

An unusual number of mills have been broken down within a few weeks. One of the machine works in this city had seven mills to repair at once last week. These breakages are probably owing to the sudden changes in the temperature, affecting the nice adjustment of heavy machinery. A great number of railroad axles have also broken in the same time.—[Providence Journal.

H. R. Serrell, C. E., of this city recommends securing a wire gauze screen in a cast-iron frame, to the outside of every railroad window. This is to prevent passengers from thrusting out their heads or arms, many accidents having occurred from doing this, in spite of printed cards of warning. The recommendation is a good one.

Consumption of Fuel in Steam Engines with Single and Double Cylinders.

M. Farcot, machinist, at Port St. Ouen, has made experiments upon two machines made by him for the plate-glass manufactory of St. Cobin, which may serve as a basis for a rigorous comparison between machines of one and two cylinders. The experiments were made under the direction of M. Laforet, engineer of the glass-works at Chauny. The first machine, with two cylinders, has a nominal power of 30 horse, and makes 28 revolutions per minute.—When tried on the 26th October, during 5 hours, at 38 horse-power, under a pressure from 4·75 to 5 atmospheres, it consumed less than 1·15 kil. (2½ lbs.) of common charcoal per horse-power per hour. Afterwards tried at 49 horse-power, it worked with the greatest ease

The second machine is horizontal, has but one cylinder, working at 42 revolutions per minute, and is also nominally 30 horse-power. Tried for 5 hours on the 28th October, it consumed only 1·106 kil. (2·4 lbs.) per horse-power per hour. Afterwards tried at 49 horse-power, it gave no evidence of injury to any of its running parts. These two machines have now been in regular service for several months, and work usually with a force of from 40 to 45 horse-power.

It has been hitherto admitted, that the double cylinder machines expended less steam and fuel than those with but one cylinder. The preceding experiments show that when well constructed, the expenditure is the same in both systems. If it be true, theoretically, that the double cylinder machines work more regularly, it is now certain, that practically, the one-cylinder machines of M. Farcot work with a perfect regularity. Horizontal (oscillating?) engines, for instance, drive spinning machinery, and paper works more regularly than the hydraulic motors which they replace, and actually leave nothing to be desired. Their price, for equal force, is less than that of fixed machines, and their velocity is in better adjustment to that of the shafts which they drive.

Our readers will observe the low rate of consumption in these two machines; it is much less than that required for the best engines turning an axis, hitherto known. The arts have therefore realized, in this respect, an immense progress of 2 or even 3 kilogrammes (4½ to 6½ lbs.) per horse-power per hour. This advance is especially due to the Society for the Encouragement of National Industry, for they have always excited, proved, sanctioned, and recompensed it.—"Cosmos;" translated for the Journal of the Franklin Institute.

[The above, we infer, relates simply to the connecting rod of one piston driving a single shaft, and the connecting rods of two pistons, also driving a single shaft. In theory there can be no difference, and we do not see how in practice any could be expected. We should like to see the results of experiments on the fuel used by engines with one cylinder exclusively, and one with two cylinders, a high pressure and an expanding one—the latter taking the steam from the former; such a set of experiments would be valuable. A saving of fuel has been claimed for such engines, but we like the single cylinder ones the best, cutting off at an early part of the stroke; they are more simple, compact, and less expensive.

Scarcity of Common Sense.

Barnes, formerly editor of the London "Times," said to Thomas Moore, that the great deficiency he found among his writers, was not talent but common sense. Not one of them, he said, could be trusted to write often or long on the same subject, as they were sure to get bewildered with it, and he included himself in the remark.

Balance Valves for Locomotives.

We have received a letter from Robert Gray, engineer in the Machinery Department of the Crystal Palace, who states that he has invented a balance valve for locomotives, which can be worked with the greatest ease under any degree of pressure. This will certainly be a great relief to locomotive engineers.

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TO CORRESPONDENTS.

C. B., of Pa.—Your plan, in some of its parts, is patentable, and the patent would have to be on the peculiarly constructed truck for the object specified. The evil to be remedied is one we have often spoken of; but other plans than the one you have proposed, may also be substituted.

H. M. P., of Mass.—Your idea is that a certain amount of heat will increase the pressure of a certain amount of air in a cylinder, and that if three times the quantity of air is packed in the vessel, the same amount of heat will increase its pressure three-fold—that is, perpetual motion. We have no wish to examine this at any greater length.

S. G. W., of Mich.—The best advice we can give you with respect to your spiles, is to dry them by steam, high pressure, and then burn them outside, so as to char them one-eighth of an inch deep, then drive them in; if you had apparatus to impregnate them with a solution of the sulphate of copper and alum, we would recommend you to do so.

J. E. B., of Conn.—In your letter on governors, the part of it which says that centrifugal force and gravity have nothing to do with the question, is liable to be mistaken, for although the action is dependent on increments of speed, the governor is employed for the very purpose of regulating the speed. The rest of your letter is very good except that which relates to T., he is a sincere honest man.

A. B. B., of N. Y.—You have not told us the depth of your wheel buckets. But your wheel of 40 feet diameter, by using 13 feet of water per second, will exert nearly 40 horse power, and as your pond contains 20,000,000 cubic feet of water, it will run the wheel nearly 406 hours; the power of the water is as the hight of the fall and the quantity that falls in a given time.

S. M. E, of Ohio—We cannot furnish you with the back numbers. Write to Stillman, Allen & Co., of the Novelty Works, this city, and give a full description of what you want; those engaged in the manufacture of the apparatus can give you the most minute information on the subject.

G. A. R. & Co., of N. H.—Have you any fire bridges under your boiler, or do you simply use straight flues? It is no easy matter to get rid of sparks or smoke; if you get rid of the former you are sure to get rid of the latter. You should at least have a very long furnace, and feed close to the door, then push back the red embers, as you feed in, by this plan the smoke and sparks would pass over the face of a red fire and be consumed. Make the flue to dip down at the back of the fire, if possible, so as to bring the sparks down on the red embers. You might use a copper gauze screen at the neck of your chimney, to catch the sparks.

E. W., of N. Y.—We have never known spiral springs used to strain muley saws, we cannot recommend you to try them; the speed of the saw usually varies from 200 to 300; 90 to 100 does very well for your engine; use a belt; a 20 feet flue boiler should be sufficient, with a cylinder 10 inch bore and 2 feet stroke; the proportions of cylinder may vary according to the fancy of the engineer. Old boilers, if clean and tight, will generate steam as rapidly as new, the varieties of iron affect the strength of the boiler only.

J. B. R., of N. Y.—The using heat over again is as great an absurdity as the attempt to create a perpetual motion; Ericsson himself has abandoned it,—your ideas are impracticable.

F. B., of N. Y.—Your plans for the propulsion of vessels have both been tried long ago and abandoned.

N. Y., of Ohio.—Your plan, although a good one, perhaps does not fulfill the requirements of the committee as they call for an invention to prevent the changing the name of the bank as well as the denomination of the bill.

H. H., of Mass.—We are aware that gate saws have been run with a belt, but we are still inclined to prefer the crank; a balance crank should of course be used in all cases.

A. P. C., of N. Y.—We have recently taken a patent in England for a propeller wheel, which embraces your idea identically.

H. S. W., of Ohio—Your Letters Patent have been received.

W. J. F. L., of Pa.—We think your plan for a Tuyere Iron is new and patentable. A circular, giving information as to the size of models required by the Patent Office, and other hints concerning applications, has been sent you. The engravings of your Iron Punch are nearly ready for publication.

J. L., of N. C.—For details of such machiney as you may wish to purchase, we would refer you to Joseph E. Holmes, at the Crystal Palace. For a consideration he will attend to your enquiries, and we can recommend him as a very reliable man and a good mechanic.

G. T. P., of N. Y.—The manner you describe for ringing a bell at railroad crossings, is different from anything we have before seen, but we do not think that railroad companies would adopt it at their own expense.

R. S. Blount, of Galveston, Texas, wishes to procure a corn dryer capable of drying 100 bushels per day. We presume some of our readers can furnish him with an apparatus of this kind.

O. S., of Pa.—Considerable call is made on us for sash door and blind machinery, but we are not acquainted with a single maker in the business,—can't give any information.

A. S. L., of Pa.—We do not know the name of the inventor of the ear instrument published in our paper of the 25th inst. We have furnished all the information we possess upon the subject.

B. N. C., of N. Y.—A caveat does not secure an invention from infringement; it affords the caveator a right to receive a notice of any interfering application for a patent made within one year after the caveat is filed.

H. B., of Ind.—We do not discover any patentable feature in your pump; neither can we discover that it contains any advantage not already possessed by the ordinary double-action pumps.

E. J. L., of Va.—There is not, in our opinion, any patentable novelty in your described improvement in Corn Shellers; it does not, in our judgment, involve an invention in the sense in which it is understood.

J. M. R., of Mass.—No letter sent to this office will receive attention unless the writer's name is furnished.—Your letter we have not preserved.

F. B. A., of Ill.—Your bullet machine appears to be quite new, and we advise you to send us a model. The size must not exceed a cubic foot.

J. H. G., of Ct.—There is no good work that we can recommend devoted to the jewelry trade.

A. H., of N. Y.—We are gratified with the very high opinion you have expressed in regard to the Scientific American, and also of our Patent Agency. It has been our endeavor at all times to publish a reliable journal in every respect, and also to conduct an agency for securing patents governed by the strictest sense of honor.

J. H. H., of ——.—You can purchase a hand printing press of Messrs. Hoe & Co., of this city; we don't know the price.

R. F., of Tenn.—We published an engraving and description of Barker's Pump in Vol. 7; by referring to it you will find our remarks accompanying the engraving.

J. M. K., of Mass.—The "Cloud Engine" is operated by a mixture of steam and hot air or carbonic acid gas. We cannot describe its construction as it is very complicated.

Money received on account of Patent Office business for the week ending Saturday, March 11:—

A. J., of Ind., $25; J. S. S., of Md., $25; O. B., of Ind., $13; U. B, V., of Pa., $30; K. & B., of N. Y., $30; J. G., Senr., of Ind., $30; C. H. P., of N. Y., $275; A. A. S., of N. Y., $25; T. F. C., of Vt., $30; J. W., of Mass., $25; J. C., of N. Y., $300; T. H. P., of Me., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, March 11:—

A. J., of Ind.: A. H., of O.: O. B., of Ind.: J. S. S., of Md.; J. C., of N. Y.; D. D., of Pa.: A. A. S., of N. Y.; J. W., of Mass.; B. S. W., of R. I.

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☞ All advertisements must be paid for before inserting.

American and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express, or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

MUNN & CO., Scientific American Office, 128 Fulton street, New York.

EUROPEAN PATENTS.—MESSRS. MUNN & CO. pay especial attention to the procuring of Patents in foreign countries, and are prepared to secure patents in all nations where Patent Laws exist. We have our own special agents in the chief European cities; this enables us to communicate directly with Patent Departments, and to save much time and expense to applicants.

FOR SALE—642 acres Heavy Timbered Land, situated one mile from Spruce Grove, Pa., and two miles from the Lackawanna and Western R.R., now being built; there is on the premises two dwellings, a bedstead factory, and machinery for manufacturing bedsteads; also a veneer saw, saw mill, with a 20 feet overshot wheel; also four other water powers on the property. Must be sold by the first of April to close a partnership concern. For particulars address YOTHERS & HOUCK, Spruce Grove, Monroe Co., Pa. 1*

WROUGHT IRON DIRECT FROM THE Ore—The owners of James Renton's Patent are now prepared to sell rights for this most valuable invention. Apply to JAMES RENTON, Cleveland, Ohio, or to A. H. BROWN, 107 Market st., Newark, N. J. 27 10*

SCREW CUTTING MACHINES. with P. W. Gates' Patent Dies—The subscribers keep constantly on hand three sizes of the above-named machines, to wit—No. 1 machine, 10 sets dies and taps from one-half to two inches, $350: No. 2, 8 sets dies and taps, one-half to one and a half inches, $250; No. 3, 6 sets dies and taps, three-eighths to one inch, $150. Cash on delivery at shop. P. W. GATES & CO. Chicago, Ill. 27 13

HUDSON MACHINE WORKS and Iron Foundry—at Hudson City, N. Y., are prepared to contract for castings for railroads, bridges, buildings, gas pipes and posts, water pipe, cast-iron ornamental floors, cannon, &c. Steam engines and boilers, high and low pressure, sugar mills, Cornish lifting and forcing pumps for mines; stamps, mortars, and mining machinery;—also superior hydraulic pumps and presses, and superior machinists' tools made to order. Especial attention given to the making of patent machines. Orders by mail will receive prompt attention. New York Office No. 18 Exchange Place. FREDERIC COOK & CO.
F. COOK. H. McCLELLAND. 27tf

PIANOFORTE MANUFACTURERS—Are invited to examine the new and various patterns of carved legs now in store, also glue warranted to stand in all climates, and therefore particularly adapted to Pianoforte work; "Excelsior" Sand Paper, Pumice Stone, ground and in lump, Rotton Stone, &c., &c. WM. B. PARSONS & CO., 290 Pearl street, (near Beekman) New York. 26 2*

CLINTON FOUNDRY—502 and 504 Water street, N. Y. A large and valuable collection of pulley and machinery Patterns; also loam and dry sand Castings, such as Printing and Steam Cylinders, Sugar Pans, Kettles, Vats, Curbs, Rollers, Pipes, &c. A general assortment of Pulleys always on hand.
26 6* REANEY & McKINLEY,

BARSTOW & WOODMAN, Attorneys and Patent Agents, 74 Wall st, are prepared to aid Patentees, in introducing their inventions into use, or in the sale of rights or prosecution of violators. Address as above, post-paid. 26 2*

PORTABLE STEAM ENGINES—The subscriber is now prepared to supply excellent Portable Engines, with Boilers, Pumps, Heaters, etc., all complete, and very compact, say 1, 2, 2, 1-2, 3, 4, 6, 8, and 10 horse-power, suitable for printers, carpenters, farmers, planters, &c., they can be used with wood, bituminous, or hard coal; a 2 1-2 horse engine can be seen in store, it occupies a space 5 feet by 3 feet, weighs 1500 lbs., price $240; other sizes in proportion. S. C. HILLS.
25eotf Machinery Agent, 12 Platt st, N. Y.

PIG IRON—The subscriber has always on hand a stock of the best brands of American and Scotch Pig Iron, for sale at the lowest market price. G. O. ROBERTSON, 135 Water st, cor. Pine, N. Y. 13 14eow

UNITED STATES PATENT OFFICE.
Washington, Feb. 16, 1854.

ON THE PETITION of Samuel F. B. Morse, of Poughkeepsie, New York, praying for the extension of a patent granted to him on the 20th of June, 1840, for an improvement in the mode of communicating information by signals, by the application of electro-magnetism, for seven years from the expiration of said patent, which takes place on the 20th day of June, 1854—

It is ordered that the said petition be heard at the Patent Office, on Monday, 22nd day of May next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing. All testimony filed by either party, to be used at the said hearing, must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 12th of May: depositions, and other papers relied upon as testimony must be filed in the Office on or before the morning of the 13th May: the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer and Evening Star, Washington, D. C.; Pensylvanian, Philadelphia, Pa.; Scientific American, New York; and Inquirer, Cincinnati, Ohio, once a week for three successive weeks previous to the 22d of April next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy, and send their bills to the Patent Office, with a paper containing this notice. 26 3t

UNITED STATES PATENT OFFICE.
Washington, February 13, 1854

ON THE PETITION of Samuel Blatchford, administrator of Orlando Jones, deceased, of Auburn, N. Y., praying for the extension of a patent granted to the said Orlando Jones, on the 30th day of April, 1840, for an improvement in the manufacture of Starch, for seven years from the expiration of said patent, which takes place on the 30th day of April, eighteen hundred and fifty-four—

It is ordered that the said petition be heard at the Patent Office on Monday, the 24th day of April next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Pa.; Scientific American, New York; Post, Boston, Massachusetts and Enquirer, Cincinnati, Ohio, once a week for three successive weeks previous to the 24th day of April next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 25 3

THE HAND BOOK FOR THE ARTISAN, MECHANIC AND ENGINEER—By the well-known Mechanical author, OLIVER BYRNE, is this day published by T. K. Collins, Jr., No. 8 North Sixth street, Philadelphia, Pa. It will maintain its place among among the other numerous and justly valued works of this author. The work contains the arts of Polishing, Lackering, Grinding, Japanning, Staining, and Burnishing, as well as the arts of perfecting engine works and mechanical designs: the ornamenting of wood, stone, marble, glass, diamonds, iron, steel, and works in all sorts of metals and alloys, and the various abrasive processes that effect what cannot be done by cutting tools. To which is added a dictionary of apparatus, materials, and processes employed in the mechanical and useful arts, for Grinding, Polishing, and Ornamenting. This work contains 483 pages 8vo., eleven large plates, and 185 wood engravings. Price $5. It will be sent by mail free of postage on receipt of $5. 25 5

BAKER'S IMPROVED BOILER FURNACE—As used at the Crystal Palace: orders received for Stationary, Marine, or Locomotive Furnaces on this plan, and also for the rights for towns, counties, or States: certificates can be shown of furnaces in use for stationary, marine, and locomotive furnaces, with saving from 30 to 50 per cent. in fuel. J. AMORY,
25tf General Agent, 28 State st, Boston, Mass.

J. A. FAY & CO., Worcester, Mass., Builders of Daniel's Planers, with improvements, and Matching Machines with carriage, to joint and match parallel or taper. 25 4*

NORCROSS' ROTARY PLANING MACHINE It has been affirmed by a decision of the Supreme Court of the U. S. that the Norcross Patent does not infringe the Woodworth machine. Having obtained the above decision in my favor, I now offer to the public my machines and the right to use them. And I have no hesitation in saying that they are much superior to any other planing machine in use. I obtained medals at the Fair in Boston, and at the American Institute in New York, for the best planing in competition with the best Woodworth machines. And now that the question of infringement is settled by the highest authority, the public can have them at a fair price. They are not only the best machines ever invented, but the safest—the life of the operator is not endangered as with other machines, which consideration alone is worth four-fold what I ask for the right to use them.
N. G. NORCROSS.
Lowell, Mass., Feb. 11th, 1854. 24 6*

GREAT IMPROVEMENT IN STEAM ENGINES—Tremper's Patent Spherical Governor & Fuel Economiser. This Regulator and Economiser will do more work with a given amount of steam than other known mode without expensive cut-offs expansion valves or other complicated fixtures, no change of motion to interfere with the most delicate work in any case, and being both a regulator and steam economiser at a nominal expense: warranted to supersede by far all others, or the money returned. JOHN TREMPER.
23 5* Highland Iron Works, Newburgh, N. Y.

ATKINS' SELF-RAKING REAPER.—40 of these machines were used the last harvest in grass or grain or both, with almost uniformly good success, in nine different States and Canada. Twenty-six premiums, including two at the Crystal Palace, (silver and bronze medals,) were awarded it at the autumn exhibitions. I am building only 300, which are being rapidly ordered. Mr. Joseph Hall, Rochester, N. Y., will also build a few. Early orders necessary to insure a reaper.

Price at Chicago $175—$75 Cash with order, note for $50, payable when reaper works successfully, and another for $50, payable 1st December next with interest. Or $160 cash in advance. Warranted to be a good Self-Raking Reaper. Agents properly recommended wanted throughout the country. Experienced agents preferred. It is important this year to have the machines widely scattered. Descriptive circulars with cuts, and giving impartially the difficulties as well as success of the reaper, mailed to post-paid applications.
J. S. WRIGHT.
24 4* "Prairie Farmer" Warehouse, Chicago, Ill.

SHINGLE MACHINES—Wood's patented improvement in Shingle Machines, is unquestionably the best ever offered to the public. The undersigned is now at the West, offering rights in this machine for sale. It is a rare opportunity for a safe and profitable investment in a machine without a rival, for the purpose to which it is applied. Parties wishing to correspond with me can do so by addressing J. D. JOHNSON,
21tf Bridgeport, Ct.

A. B. ELY, Counsellor at Law, 52 Washington street, Boston, will give particular attention to Patent Cases. Refers to Messrs Munn & Co., Scientific American.
27 1y*

$500 REWARD—For an Invention to Prevent the Alteration of Bank Notes. To Chemists and others. In order to prevent the loss and annoyance occasioned by the ALTERATION of Bank Notes either by changing the name of the Bank, or the denomination of the Bill, as practiced by counterfeiters, and to procure an effectual barrier to such practices, by encouraging the invention of materials, such as ink and paper, of a nature to afford in either or in any combination of them, the desired protection—the Executive Committee of the Association of Banks for the Suppression of Counterfeiting, will pay the sum of Five Hundred Dollars to any person who shall invent the best mode, in the opinion of the Committee, of accomplishing the object named. All plans to be submitted to the undersigned on or before the 25th day of March next, and to be accompanied with such explanations of the materials and processes as the party applying may be willing to disclose. Each applicant to lodge with the Treasurer of the Association, Henry M. Holbrook, Esq., for the term of three months, the sum of one hundred dollars, which shall be paid to any person who shall, during that time, alter, by removing and printing anew, any material portion of a bill or note prepared in accordance with the plan submitted, in such a manner that the alteration would, in the judgment of the Committee, be likely to pass unsuspected. And if, at the end of said three months, no one has been able to effect such alteration, and the Committee are satisfied that the materials proposed will stand all the tests which the present knowledge of chemistry affords, then the hundred dollars will be returned, and the reward paid over to the successful applicant, and the hundred dollars deposited by each of the other applicants to be returned to them respectively. Per order of the Executive Committee,
J. M. GORDON, Secretary.
Columbian Bank, Boston, Mass., Jan 24, 1854. 22 7

NEW HAVEN MANUFACTURING COMPANY—New Haven, Conn., (successors to Scranton & Parshley) have on hand Power Planers, to plane from 3 to 12 feet; slide lathes from 6 to 18 feet long; 3 sizes of hand lathes, with and without shears; and counter shafts: universal chucks; drill presses, index plates, bolt cutters, and slide rests. The N. H. M. Company also have the right for Harrison's patent Flour and Grist Mill for the term of five years, and are prepared to furnish these superior mills at short notice. They are unequalled by any other mill, and will grind from 20 to 30 bushels per hour, and will run without heating, being self-cooling. They weigh about 1400 lbs., are of the best French burr stone, 30 inches in diameter; are snugly packed in a cast-iron frame, price of mill $200, packing $5. For cuts, prices, and further particulars apply post-paid, as above, or to S. C. HILLS, agent N. H. M. Co., 12 Platt st., N. Y. 22tf

AMERICAN RAILROAD JOURNAL—This Journal, the oldest in the world devoted to the Railroad interest, will hereafter contain, in addition to its usual contents, a full and comprehensive department of Railway and Mechanical Engineering, prepared under the direction of a practical engineer and mechanic.—Improvements in Railways, Railway Equipments, and especially in Locomotives, will be duly described and illustrated. Inventors and improvers will find the Journal the best advertising medium, as it is taken by nearly all Railroad Companies and Engineers in the country. Published every Saturday at No. 9 Spruce st, by JOHN H. SCHULTZ & CO., at $5 a year in advance. 23 5*

PORTABLE STEAM ENGINES—GEORGE VAIL & CO., Speedwell Iron Works, Morristown, N. J., LOGAN VAIL & CO., No. 9 Gold st, N. Y., are prepared to furnish Portable Steam Engine from four to eight horse power, with locomotive boilers. These engines are recommended for their simplicity, durability, and economy, being made from the best materials and designed for practical use. They are placed on wheels convenient to be moved from place to place, and are shipped in working order: for plantation use, machinist, or others wanting small power, these engines will be found superior to any others in use. A Silver Medal was awarded at the late Fair of the American Institute, and a premium in cash of $100 at the Maryland State Fair, held at Baltimore in October last. Persons writing us by mail will be particular to give their address in full.
21 38*

JOHN PARSHLEY, No. 5 and 7 Howard st., New Haven, Ct., manufacturer of Machinists' Tools, and Steam Engines, has now finishing off 25 Engine Lathes, 6 feet shears, 4 feet between centers, 15 inches swing, and weighs about 1100 lbs. These Lathes have back and screw gear, jib rest, with screw feed, and the rest is so arranged that the tool can be adjusted to any point the work may require, without unfastening the tool, hence they possess all the good qualities of the jib and the weight lathe; they are of the best workmanship. Price of Lathe with count shaft and pulleys, $155 cash. Cuts, with full description of the lathe, can be had by addressing as above, post-paid. Also four 30 horse power vertical Steam Engines with two cylinders. Price of engine with pump and heater, $800 cash. For particulars address as above. 19tf

C. B. HUTCHINSON'S PATENT STAVE Cutting Machines—The best in use, and applicable alike to thick and thin staves, for barrels, hogsheads, &c.; also his Head Cutting and Turning, and Stave Jointing and Crozing Machines. This machinery reduces the expense of manufacturing at least fifty per cent. For machines or territorial rights, apply to C. B. HUTCHINSON & CO., Syracuse, N. Y. 2tf

ENGINEERING.—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic, Self-adjusting Conical Packing, Faber's Water Gauge, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc., etc.
CHARLES W. COPELAND,
20 tf Consulting Engineer, 64 Broadway.

PLANING, TONGUING, AND GROOVING—BEARDSLEE'S PATENT.—Practical operation of these Machines throughout every portion of the United States, in working all kinds of wood, has proved them to be superior to any and all others. The work they produce cannot be equalled by the hand plane. They work from 100 to 200 feet, lineal measure, per minute. One machine has planed over twenty millions of feet during the last two years, another more than twelve millions of feet Spruce flooring in ten months.. Working models can be seen at the Crystal Palace, where further information can be obtained, or of the patentee at Albany, N. Y
1 tf GEO. W. BEARDSLEE.

MINING MACHINERY—Of most approved construction, furnished by FRED'K COOK & CO, Hudson Machine Works, Hudson, N. Y. 15 6m

LEONARD'S MACHINERY DEPOT, 109, Pearl st., and 60 Beaver, N. Y.—Leather Banding Manufactory, N. Y.—Machinist's Tools, a large assortment from the "Lowell Machine Shop," and other celebrated makers. Also, a general supply of mechanics' and manufacturers' articles, and a superior quality of oak-tanned Leather Belting. P. A. LEONARD.
1tf

McALLISTER & BROTHER.—Opticians and dealers in mathematical and optical instruments, No. 48 Chesnut st., Philadelphia, Pa.—at the old stand established in 1796 by John McAllister, Senr. Mathematical instruments separate and in cases, Tape Measures, Spectacles, Spy Glasses, Microscopes, Thermometers, Salometers, Hydrometers, Magic Lanterns, &c., &c. Our illustrated and priced catalogue are furnished on application, and will be sent by mail free of charge. 10tf

NORRIS WORKS, Norristown, Pa. The subscribers build and send to any part of the United States, Pumping, Hoisting, Stamping, and Portable Engines, and Mining Machinery of every description.
41 1y.* THOMAS, CORSON & WEST.

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Scientific Museum.

Photographs on Steel Plates.

The following are some statements which were made at a meeting of the Academy of Sciences, in Paris, on the processes of Mr. Talbot, and M. Niepce de St. Victor, respecting the invention of photographic images on steel plates:—"The processes of these chemists are different. Mr. Talbot uses, for the substance impressible to light, a mixture of gelatine and bichromate of potash, which is modified and browned on the immediate contact of light, and only where the light acts, whilst the part covered by the object to be copied remains untouched, and may always be removed by water. M. Niepce has aimed to perfect the process which his uncle, the inventor of heliography, described in the year 1827. The sensitive substance is a solution of bitumen in essence of lavender, applied in a layer; this varnish changes its properties while under the action of light. The parts exposed to the sun become insoluble in a mixture of essence of lavender and oil of petroleum, so that they may be easily separated from the soluble part not impressed, which represents the image to be reproduced. The liquid employed by Mr. Talbot for biting in on steel, after his design, is bichloride of platinum, and that of M. Niepce, a mixture made of one part of nitric acid, eight parts of distilled water, and two of alcohol."

Lithographic Photography.

In a recent sitting of the "Societe d' Encouragement pour l Industrie Nationale," the process of reproducing photographs by means of lithographs was thus described: An ordinary lithographic stone is taken, and a solution of pitch is placed on it. A negative photographic proof is then put on it and is pressed upon the stone for a period which may vary from ten minutes to four or five hours. The stone is then washed with pure ether. The figure is found properly marked with its lights and shades, and it may be inked and printed from as an ordinary lithograph.—[Exchange.

[This account is very unsatisfactory; as it does not describe the mode of placing the photographic image on the stone.

Price of Scents.

Piesse, in his annals of chemistry, says:—"The wealth of England is aptly illustrated by showing what Britannia spends, and the duty she pays to the Exchequer, for the mere pleasure of perfuming her handkerchief. As flowers, for the sake of their perfumes, are on the continent principally cultivated for trade purposes, the odors derived from them, when imported into this country, in the form of essential oils, are taxed with a small duty of 1s. per pound, and is found to yield a revenue of just £12,000 per annum. The duty upon Eau-de-Cologne, imported in the year 1852, was, in round numbers, £10,000, being 1s. per bottle upon 200,000 flagons imported. The duty upon the spirits used in the manufacture of perfumery at home, is at least £20,000, making a total £42,000 per annum to the revenue, independent of the tax upon snuff, which some of the ancient Britons indulge their noses with. If £42,000 represents the small tax upon perfuming substances for one year, ten times that amount is the very lowest estimate which can be put upon the articles as their average retail cost. By these calculations (and they are quite within the mark), we discover that Britannia spends £420,000, (about $2,000,000 a year in perfumery."

Increase in the Use of Gutta Percha.

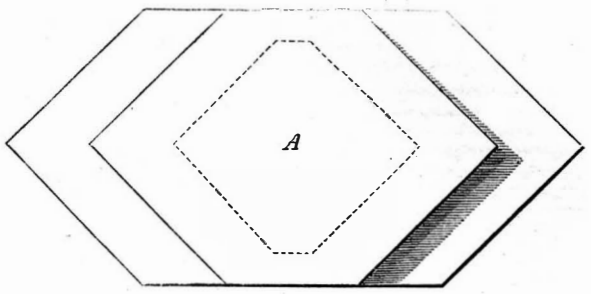
In the year 1844, two hundred pounds of a new species of gum were shipped from Singapore, India. It was considered doubtful at the time whether the gum could ever be rendered sufficiently useful to mankind to become an article of commerce. The experiment, however, succeeded. More than twenty thousand pounds were exported in the succeeding year. The fame of the article spread North, South, East and West; men, women and children were employed in its collection, and the new trade has increased in magnitude and extent with every successive year.

Improvement in Exhausting Steam.

The annexed engravings are views of an excellent improvement on steam ports in valve seats and slide valves for steam engines of every description, for which a patent was granted to Stephen D. Wilson, of Reading, Pa., on the 10th of last January (1854.)

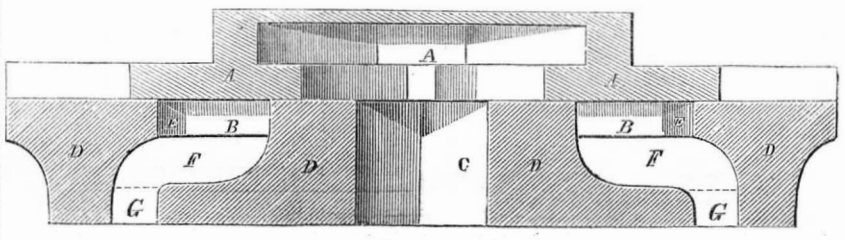
Fig. 1 is a top surface view of the valve; fig. 2 is a transverse section of the valve and valve seat; and figure 3 is a surface view of the valve seat. The same letters refer to like parts. The nature of the invention consists in the enlargement and peculiar construction of the steam ports on the valve seats of steam engines, and in adapting the valve to these ports, so as to exhaust steam from one end of the cylinder with much greater rapidity than it is admitted at the other, all of which is accomplished by the same motion with a single slide valve; this diminishes the resistance of the exhaust steam, and increases the power and speed of the engine. The steam chest is constructed in any of the known forms, and is represented here by D, in figs. 2 and 3. On it is placed a slide valve, A. fig. 1. No change is made in the size or form of the steam port, G, in common use,

Figure 1.



leading from the cylinder to the seat of the steam chest until it reaches the seat. The port, F, is there enlarged in the seat until it is equal in capacity to twice the steam port, G. It is continued of this size to the surface of the seat of the steam chest, B and E, in figs. 2 and 3. The valve, A, in fig. 1, is made in any of the known forms, and it is moved by the common eccentric motion, except that the shape of the valve is altered, so as to adapt it to the form of the opening in the seat. The valve motion is then arranged, so that it will open only one half the port, F, for *induction* E, and the other half for *eduction*, B. The object is to exhaust the steam in the shortest possible time, so as to relieve the piston of the engine from all resistance to the action of the inlet steam. On the face of the seat, D, fig. 3, that portion of the opening of the steam port, E, used for induction, is shaped as long, in the direction of the stroke of the engine, as the steam chest will admit of, and as narrow as possible to admit sufficient steam to work the engine at its full power. The aperture, E, is made either straight, angular, or semicircular, as may be preferred. The other half, B, on the face of the seat, D, fig. 3, is shaped as long as the steam chest will admit of at right angles with the length of the cylinder, or it may be varied by giving it a semicircular or angular form, such as B in fig. 3, as narrow

Figure 2.

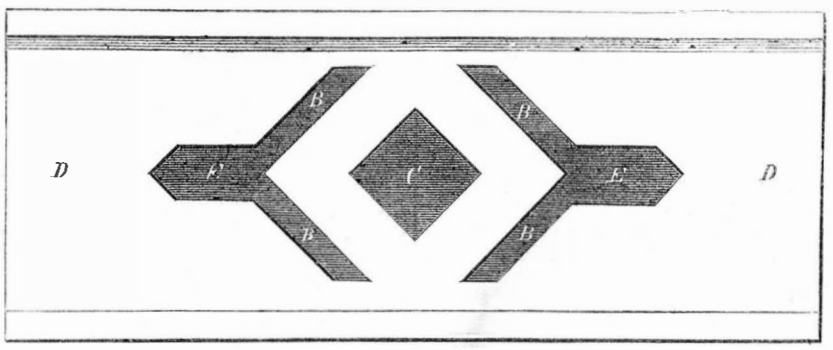


as possible, just widening it enough to make the eduction opening, B, equal in capacity to the induction opening, E.

By this arrangement of steam ports, the inventor is thereby enabled to exhaust the steam from the cylinder, with an increased speed, just in the ratio the opening B, bears to the opening E, in a line parallel with the length of the cylinder, thereby dispensing with the necessity of giving lead to the exhaust, thus saving the full force of the steam to the finishing of the stroke, securing the greater benefits of expansion, and an increase of speed and power.

The exhaust port, C, figs. 2 and 3, is made in the common form, sufficiently large to con-

Figure 3.



duct off the steam as fast as it escapes through the eduction port, B, and it is of a shape to suit the other portions of the seat and the valve and its action. If deemed expedient, however, in the working of an engine, any amount of lead and lap may also be given to this valve, without impairing its advantages.

This improvement deserves general attention. It comes to us, also, recommended by some of the best practical engineers in our country.

For further particulars respecting it, address Joel B. Warner, Esq., Reading, Pa.

Softening of the Brain.

The cases of softening of the brain, which have of late years become so frequent, render that disease one of important and interesting medical study. Dr. Albers, a European physician, of celebrity, states that he has dissected the brains of several persons who had for many years undergone great mental labor, and that in all these he found the cerebral substance unusually firm, the gray substance as well as the convolution being remarkably developed. In several of these instances a settled melancholy had taken possession of the mind during the latter period of life. He believes, therefore, that to produce a softened condition, some additional influence beyond mere over-exertion is required.

Effects of Soda in Steam Boilers.

Some time ago you published Dr. R. Fresenius' discovery of the use of carbonate of soda to prevent the incrustations in steam boilers, in which water is used that contains sulphate of lime. Dr. Zimmer, of Frankfort, in whose chemical works the soda for this purpose was first used, found that his boilers were destroyed by corrosion after the soda had been used for some time. From his investigations all soda contains more or less cyanide of sodium; he is of the opinion that the cyanid is the cause of this corrosion.

"Dr. R. Bottger cautions against the use of soda for the above purpose, saying that according to repeated tests, all soda, even from the most celebrated manufactories, contains cyanid of sodium."—[From Dr. R. Böttger's Polytech. Notezblatt.

The "Baltimore Patriot" says the amount of guano which will be imported into that city the present year, will probably reach 60,000 tons, costing three millions of dollars.

LITERARY NOTICES.

THE BRITISH QUARTERLIES AND BLACKWOOD'S MAGAZINE.—Leonard Scott & Co., 54 Gold street, this city, republish the London, Edinburgh, *North British*, and Westminster Reviews, and Blackwood's Edinburgh Magazine. The fame of Blackwood is world-wide, and the Reviews are all distinguished for ability and originality. Carlyle and Macauley speak through the Edinburgh, and the ablest divines in the Scotch Church, through the North British. Alison often speaks through Blackwood, and Bulwer is a regular contributor. Science, art, politic , his ory, everything of interest, in fact, is discussed in their columns with ability. These works will be universally interesting during the present year, owing to the excited state of European politics. Early sheets from the British publishers are furnished, so that the Reprints are placed in the hands of subscribers as soon as they can be provided with foreign copies. They are furnished at very low prices:—For one of the four Reviews, per annum, $3; for any two of the four Reviews, $5: for any three of the four Reviews, $7; for all four of the Reviews, $8; for Blackwood's Magazine, $3; for Blackwood and three Reviews, $9; for Blackwood and the four Reviews, $10. These Reviews speak the sentiments of the Conservative, Whig, and Liberal parties, of Britain. Blackwood, is Tory, but always rich and racy. Prof. Ayton, author of the "Lays of the Cavaliers." is its Editor. The North British is Free Church: its Editor is Prof. Fraser. The old Edinburgh Review has done more towards reforming the laws of Britain than all the speeches made in Parliament. Those who would be intelligent in foreign literature and politics must read these periodicals.

THE CHEMISTRY OF COMMON LIFE.—D. Appleton & Co., of this city, are now publishing a series of pamphlets with th s title, the author of which is Prof. Johnston, who is also author of a number of excellent works on Agricultural Chemistry. The first of the series which is now before us contains two of the English tracts treating of "The Air we Breathe," "The Water we Drink," "The Soil we Cultivate," and "The Plants we Rear." The price of each is only 25 cents. We are glad Messrs. Appleton & Co. are publishing these useful tracts; they will do a great amount of good, and deserve, and will no doubt receive a very extensive circulation.

AMERICAN AGRICULTURIST—Published by Allen & Co., No. 189 Water street, New York, is a valuable and practical weekly, designed to improve the Farmer, the Planter, and the Gardener. It is one of the very best journals of the kind now published. The Editor shows his good breeding by giving credit to the "Scientific American" for notices of new inventions, and also for such of the claims of patents as are introduced into the columns of his paper. We would remind our cotemporaries who copy the claims from our columns without credit, that we pay a large sum of money every year for an official report of them.

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